3RD ANNUAL CONFERENCE OF THE INTERNATIONAL STILLBIRTH ALLIANCE

Hosted by Sands and the Perinatal Institute

ISA 2007

Perinatal Loss: Improving Care and Prevention

29 September – 2 October

Birmingham, UK

Conference Handbook *Scientific Track*

Sponsors

The organisers gratefully acknowledge sponsorship of this meeting by the following persons and organisations:

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Organisers

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Dear Delegate,

We are pleased to welcome you to ISA 2007, the Third Annual Conference of the International Stillbirth Alliance.

After an important incubation period with the SIDS Alliance, this is the first time the ISA conference is being held on its own, signifying the wide interest in examining the specific issues concerning stillbirth.

ISA conferences are unique in that they bring together bereaved parents, care professionals and scientists with a common purpose. Our theme this year - Perinatal Loss, Improving Care and Prevention - sums up its two main goals, which are:

- to improve the support which parents receive when experiencing the loss of a baby, with emphasis on ensuring that their grief is fully acknowledged and dealt with in the most professional and sensitive manner; and
- to examine the causes and factors associated with stillbirth, to formulate further research where needed, and to develop better strategies for prevention.

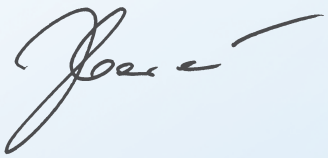
The programme has been organised in two streams which focus on the science and the support of parents. However we hope that these sessions will not just run in parallel, but intersect and inform each other throughout the meeting and well beyond. To help this along, we have introduced a joint plenary each morning, to allow a summary and discussion of the main points of each stream covered during the preceding day.

We have been fortunate to be able to bring together presentations from many of the experts in the field. But a major emphasis will be on open discussion and exchange of views, and time is set aside for this purpose throughout the conference.

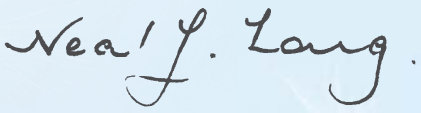
For the first time, we have also been able to extend an invitation to a number of colleagues from developing countries, to come and share the specific challenges which they are facing. These are often formidable in number as well as size of local obstacles. It is hoped that such perspectives will inform the direction of ISA, as a truly international organisation seeking to address the problem of stillbirth everywhere.

Finally, we would like to thank the many people who helped us put together this conference, including the board and scientific committee of the International Stillbirth Alliance, our generous sponsors, and Profile Productions.

Thank you for coming and taking part. With your help, we know that this meeting will be a significant step to further the cause.



Jason Gardosi
Director, Perinatal Institute



Neal Long
Director, SANDS UK

Scientific Programme

PROGRAM CHAIR: *Jason Gardosi* WORKSHOPS: *Ruth Fretts*

Sunday 30th September

08:00 - 09:15 **Breakfast Meeting** (Windows on the Lake)
ISA Scientific Committee

09:30 JOINT PLENARY

- 09:30 Welcome and Introduction — *N Long, J Gardosi*
- 09:45 The Work of the International Stillbirth Alliance — *M Sokol, F Froen*
- 10:00 ISA Parents Advisory committee — *S Ilse, L Davies*
- 10:15 A father's experience of the death of a baby — *S Guy (UK)*

10:30 Coffee/Tea

11:00 GLOBAL PERSPECTIVES
B Pattinson

- 11:00 WHO and stillbirth — *M Islam (SUI)*
- 11:20 Stillbirth and the international perspective — *R Goldenberg (USA)*
- 11:40 Implementing perinatal mortality reviews — *D Manandhar (Nepal)*
- 11:50 Rural satellite maternity centres improve perinatal outcome — *S Guruvare (India)*
- 12:00 Sociodemographic inequalities in perinatal mortality in Tanzania — *N Habib (Tanzania)*

12:10 Poster Session I International bursaries
D Ellwood, R Goldenberg, G Smith

13:00 Lunch

14:00 UNDERSTANDING STILLBIRTH THROUGH AUDIT
M Islam

- 14:00 Perinatal audit in South Africa — *R Pattinson (SA)*
- 14:20 Unexplained antepartum fetal death in Australia — *V Flenady (AUS)*
- 14:40 Socio-economic inequalities in Stillbirths in N Ireland 1993-2002 — *K Casson (UK)*
- 15:00 Perinatal mortality, ethnicity and social deprivation — *J Gardosi (UK)*

15:20 Coffee/Tea

15:40 FETAL ACTIVITY AND GROWTH
F Froen

- 15:40 Epidemiology of decreased fetal movements — *J Tveit (NOR)*
- 16:00 Prospective study of pregnancies with DFM — *R Fretts (USA)*
- 16:20 Risk Factors for fetal growth restriction — *L McCowan (NZ)*
- 16:40 Confidential Enquiries into Stillbirths with IUGR — *M Williams (UK)*

17:00 WORKSHOP: DEFINITIONS
R Fretts, V Flenady

- 17:00 Introduction; Overview of international variation — *R Fretts (USA)*
- 17:15 The use and misuse of stillbirth death rate — *G Guyon (CAN)*
- 17:30 When definition issues collide with abortion issues — *I Radestad (SWE)*

17:45 - 18:15 **General discussion**

20:00 **Mediaeval Banquet - Coombe Abbey**
(Buses depart at 19:15)

Monday 1st October

08:00 - 09:15 **Breakfast Meeting** (Windows on the Lake)
ISA - Annual General Meeting

09:30 JOINT PLENARY

- 09:30 Overview of previous day
- 10:00 Life after stillbirth: a mother's experience — *S Springall (UK)*
- 10:15 Individual grief and cultural influences — *R Sharma (UK)*

10:30 Coffee/Tea

10:50 PLACENTA: STRUCTURE AND FUNCTION
P Cox

- 10:50 Perinatal autopsy: considerations in a multicultural society — *S Gordijn (NL)*
- 11:00 Value of placental examination in the absence of postmortem consent — *T Marton (UK)*

11:20 Placental causes in 750 intrauterine deaths
F Korteweg (NL)

11:40 Placental vascular changes in cord accidents
M Parast (USA)

12:00 Markers of Placental Function and the Risk of Stillbirth
G Smith (UK)

12:20 Poster Session II
D Ellwood, R Goldenberg, G Smith

13:00 Lunch

14:00 POSTMORTEMS AND ANOMALIES
L Matturri

14:00 Postmortems in the identification of congenital anomalies
W Duke (USA)

14:20 Anomalies as a cause of high stillbirth rates in multi-ethnic communities
A Tonks (UK)

14:40 Postmortems in the diagnosis of growth restriction
P Cox (UK)

15:00 Postmortem Bacteriology
A Charles (AUS)

15:20 Coffee/Tea

15:40 INFECTION AND INFLAMMATION
A Charles

15:40 Infection and stillbirth
R Goldenberg (USA)

16:00 Intrauterine inflammation and stillbirth
A Gordon (AUS)

16:15 Parallels between SIDS and Stillbirths: a role for inflammation?
C Blackwell (AUS)

16:30 WORKSHOP: PROTOCOLS AND INVESTIGATIONS
R Fretts, JJ Erwich

16:30 Work-up of stillbirths
U Reddy (USA)

16:45 Neuropathology of unexpected perinatal loss
L Matturri (ITA)

17:00 The place of thrombophilia work up
F Korteweg (NL)

17:15 - 18:00 General discussion

19:30 ISA Dinner & Dance

Tuesday 2nd October

08:00 - 09:15 **Breakfast Meeting** (Windows on the Lake)
International Networks for Audit & Research

09:30 JOINT PLENARY

09:30 Overview of previous day

10:00 Life after stillbirth: hope with a heartbeat
S Pullen (USA)

10:15 **Presentation of abstract(s) of Best Poster Prize**

10:40 Coffee/Tea

11:00 ROUNDTABLE ON PREVENTION
J Gardosi

11:00 Researching Risk
G Smith (UK)

11:20 The promise of fetal movement
F Froen (NOR)

11:40 Preventing SGA - the old and the new
L McCowan (NZ)

12:00 Open forum

13:00 Lunch

14:00 WORKSHOP: CLASSIFICATION I
R Fretts, L McCowan

14:00 Introduction
- Who/what is a classification system for?
- What are the main challenges?

14:30 Wigglesworth and New Aberdeen
S Gould (UK)

14:45 PSANZ -*V Flenady (AUS)*

15:00 TULIP - *JJ Erwich (NL)*

15:15 CODAC - *F Froen (NOR)*

15:30 ReCoDe - *J Gardosi (UK)*

15:45 Coffee/Tea

16:00 WORKSHOP: CLASSIFICATION II
R Fretts, L McCowan

16:00 Evaluation of Classification systems
V Flenady (AUS)

16:10 Classification by 'avoidability'
M Griffiths (UK)

16:20 Whitfield in South Africa
R Pattinson (SA)

16:30 Applying modified Wigglesworth in Malaysia
R Koshy (Malaysia)

16:40-17:00 General discussion

17:00 - 17:30 **Closing session**

Conference Information

Admission to conference sessions

Admission to any conference session is by badge only. Please ensure you are in your seat at least five minutes prior to the start of each session and that your mobile phones are fully switched off.

Badges

In the interest of security please make sure that your badge is clearly visible at all times during the conference. If you loose your badge then please report immediately to the Registration Desk in the foyer of the conference suites and you will be issued with a replacement.

Befrienders

We recognise that this event may generate many emotions and have befrienders on hand who would be happy to talk with you or just be there to listen. They can be identified by an orange spot on their badges.

Bereavement Track

For the duration of the conference all sessions on the Bereavement track will be held in the Lakeside Suite for your comfort, apart from workshops when you will be directed accordingly on the day. Please note that all joint plenary sessions will be held in the Dorchester Suite.

Check-out

If you are resident in the Ramada Hotel for the duration of the conference then please note that the hotel request that you check-out of your room on the day of departure before 12pm. Should you require assistance, or you need to request a late check-out, then please let a member of the Hotel staff know at front reception, they will do their best to accommodate your needs.

Conference dinner - Monday 1st October

The International Stillbirth Alliance conference dinner will take place on Monday October 1st in the Lakeside Suite. The evening will include a welcome reception and entertainment followed by a traditional Ceilidh. Additional costs may apply for any day delegates or partners. Please ask at Registration if you have any queries.

Emergencies

In the event of an emergency please contact a member of staff from Profile Productions or a member of staff from the Ramada Hotel who you will see throughout the building. In all other instances, please dial 999.

Hotel

The Ramada Jarvis Hotel and Resort is located:

Penns Lane, Walmley,Sutton Coldfield,
West Midlands, B76 1LH
Tel: + 44 (0) 121 351 3111
Fax: + 44 (0) 121 313 1297

Joint Plenary sessions

For the duration of the conference all joint plenary sessions will be held in the Dorchester Suite.

Lunch

Lunch will be served in the main hotel Restaurant and additional seating areas have been made available in the Windsor Foyer or in the hotel bar should the need arise. Please let a member of staff know if you need any assistance.

Medieval banquet - Sunday 30th September

Come live like Lordes and Ladyes and experience a night out you will never forget at Coombe Abbey's award winning Medieval Banquet. Armed only with a dagger and a bib you will be served four courses of delicious food. Throughout the feasting banquet maids will fill your goblets with mead and wine while entertaining you with song, dance and sketches.

Tickets for this event are £45 and need to be booked and paid for by each individual wishing to attend. If you haven't reserved a place at this dinner and still with to join us then please ask a member of staff at the Registration desk.

Transport to and from Coombe Abbey is included and coaches depart from the front of the hotel at 7.15pm. Please be prompt.

Posters

Posters are located in the Dorchester Bar area and posters will be on display throughout the whole event, so please take your time to visit them. There will be prizes awarded to the best display from each of Bereavement; Scientific and Scientific (International Fellowship) Categories.

Quiet room

The room at the far end of the Windows on the Lake suite, located on the first floor, will be available for those who require some time away from the conference for reflection, prayer, or simply to have some quiet time. Memory 'leaves' will be kept here on which you may write a message in dedication or simply your baby(ies) name to hang on the memory tree in the Lakeside suite. We have provided books and newsletters for your support, but please do leave them in the room for others benefit. You will find writing materials there and you are welcome to use these freely.

Refreshments

Refreshments will be provided daily in the Dorchester Bar area alongside the Poster display at the designated times. As well as tea, coffee and herb teas, you will also find plenty of fruit and water coolers located around the conference area at all times for your comfort, so please feel free to help yourself. If you have any other requirements, then please let a member of staff know.

Registration Desk

If you have any enquiries please make your way to the Registration Desk in the foyer of the conference suites where you will find either members of Sands, the Perinatal Institute or Profile Productions on hand to answer any questions or concerns that you may have.

Scientific Track

For the duration of the conference all sessions on the Scientific track will be held in the Dorchester Suite for your comfort. Please note that all joint plenary sessions will also be held in the Dorchester Suite

Security

In the interest of security please note that there will be members of personnel located in the different areas of the venue. (Please note that these are not there to cause alarm but for your safety). Should you wish to report anything please contact a member of the conference team at the Registration Desk.

Welcome reception - Saturday 29th September

All conference attendees are invited to attend the welcome reception and supper on the 29th September from 6.30pm in the Lakeside Suite. There will be an informal drinks reception followed by a light supper. This is the perfect opportunity to catch up with colleagues, old friends and new.

Presenters of Oral (O) and Poster (P) Abstracts

* Recipient of ISA 2007 International Bursary

Presenters of Oral (O) and Poster (P) Abstracts

Fleurisca Korteweg O23, O35, P50, P51, P52, P53, P54, P55, P56
Doctor, Department of Obstetrics, University Medical Centre, Groningen, The Netherlands

***Rachel Koshy** O47 P10, P11
Principal Assistant Director, Division of Family Health Development, Ministry of Health, Putrajaya, Malaysia

***Oluwafemi Kuti** P19, P20
Consultant, Dept. of Obstetrics and Gynaecology, Obafemi Awolowo University Teaching Hospital, Ile-Ife, Nigeria

***Dharma Manandhar** O7, P14, P15
Professor and Head, Dept.of Pediatrics and President, MIRA-Kathmandu Medical College Kathmandu, Nepal

Tamas Marton O22
Consultant Pathologist, Department of Pathology, Birmingham Women's Hospital, UK

Luigi Matturri O34, P48, P49
Professor and Chairman, "Lino Rossi" Research Center, Institute of Pathology, University of Milan, Italy

***Rosemary Mbatha-Nadba** P1, P2
Lecturer, University of Botswana, Gaborone, Botswana

Lesley McCowan O16, O38
Associate Professor, Dept of Obstetrics & Gynaecology, University of Auckland, Auckland, New Zealand

Asima Mukhopadhyay P32
Dept. of Obstetrics and Gynaecology, Jessop Wing, Sheffield Teaching Hospitals, UK

***Thi Hoai Duc Nguyen** P26
Director, The Institute for Reproductive and Family Health (RaFH), Hanoi, Vietnam

Janna Nijkamp P33
Dept. of Obstetrics and Gynaecology,University Medical Centre, Groningen, The Netherlands

Mana Parast O24
Instructor, Division of Women's and Perinatal Pathology, Brigham and Women's Hospital, Boston, MA, USA

Robert C Pattinson O10, O46
Professor and Director, MRC Maternal and Infant Health Care Strategies Research Unit, Department of Obstetrics and Gynaecology, University of Pretoria, South Africa

Jyotsna Pundir P34
Registrar, Obstetrics and Gynaecology, Conquest District General Hospital, Hastings, East Sussex NHS Trust, UK

Ingela Radestad O20
Board Member, Swedish National Infant Foundation, Varberg, Sweden

Uma Reddy O33
Medical Officer, Pregnancy and Perinatology Branch National Institute of Child Health and Human Development, NIH, Washington DC, USA

***Gustavo Romero-Gutierrez** P12, P13
Obstetrician, Unit of Epidemiological Research,Mexican Institute of Social Security, Leon, Mexico

Prabha Sinha P35, P36
Consultant in Obstetrics and Gynaecology. Conquest Hospital, St Leonard's on Sea, UK

Gordon Smith O25, O36
Professor & Head Department of Obstetrics & Gynaecology, University of Cambridge, Cambridge, UK

Gargeswari Sunanda P37
Consultant Obstetrician and Gynaecologist, Heart of England Foundation Trust, West Midlands, UK

Rosnah Sutan P38
PHD Student, Dept. of Public Health, University of Aberdeen, Scotland

***Simin Taavoni** P7, P8, P9
Faculty Member and Researcher, Iran University of Medical Sciences, Tehran, Iran

Ann Tonks O27
Anomaly Specialist, Perinatal Institute, Birmingham, UK

Ravi Vandhana P39
Senior House Officer, Obstetrics and Gynaecology, New Cross Hospital, Wolverhampton, UK.

Mandy Williams O17
Research Midwife, Perinatal Institute, Birmingham, UK

* Recipient of ISA 2007 International Bursary

Sunday 30th September

O1 - A father's experience of the death of a baby

Steven Guy

Steven became involved in SANDS in 1993 when their daughter, Danielle, was stillborn. The support he received from SANDS inspired him to set up a local SANDS support group. He has been actively involved since that time and is currently Chair of SANDS.

Monday 1st September

O2 - Life after stillbirth: a mother's experience

Sam Springall

Sam is a 27 year old bereaved parent who lost her first son Thomas on the 15th August last year after a full term pregnancy. Her experience has enabled her to support other families, but also to educate and raise awareness of this tragic but sadly not uncommon complication of pregnancy. 'This conference is a further opportunity to tell my story, and not just remain a faceless statistic'.

O3 - Individual grief and cultural influences - a mother's experience

Ritu Sharma

Ritu is the mother of Ram, who was born at 27 weeks in 1994 and lived for 7 hours, Nina who was born at 20 weeks in 1995 and lived for an hour and Suraj who was stillborn at 37 weeks in 2004. She is a member of Birmingham SANDS.

Tuesday 2nd September

O4 - Life after stillbirth: hope with a heartbeat

Suzanne Pullen

As both a journalist and a bereaved parent, I found myself in a unique position after the stillbirth of my first child. I was plagued with the same questions that countless other parents had, but I had both the ability and the responsibility to look for the answers.

The two years that followed my loss and my subsequent pregnancy were filled with hundreds of heartbreaking stories of loss, examples of dedicated care providers and the investigations of a handful of researchers looking into the cause and prevention of stillbirth. They were also filled with even more questions and a growing frustration at the lack of standardized reporting, care and support.

What I learned is that no one is satisfied with the status quo. "These things just happen" is no longer an acceptable answer and almost everyone who has ever been touched by stillbirth wants to know why more isn't being done to educate, prepare or assist parents about what to expect.

In March of 2006, I wrote "Calling All Angels, " on my stillbirth, and in March of 2007 I wrote "Hope with a Heartbeat, " about my subsequent pregnancy for the San Francisco Chronicle Sunday Magazine. I used my personal story as a gateway for readers to learn about the grieving process, the dearth of research into the cause and prevention of stillbirth and the anxieties of subsequent pregnancies.

The response from readers was overwhelming. More than 700 readers have written to me in the last two years, sharing their stories and asking questions that no one can answer and few have tried. But I also heard hundreds of stories about how parents lives were forever changed by their experience, some going on to make positive change in the lives of others. There is an unquenchable thirst for parents to share their stories and a desire to honour their child in tangible ways.

Conclusions: Moving forward requires many parents to first spend time coping with the loss, honouring their child and coming to terms with the uncertainty surrounding their stillbirth. Increasing the public dialogue about the issues surrounding stillbirth creates avenues for healing among bereaved families, insights for public health care workers and resources for loved ones to help on the long road through grief. The more information parents have, the more informed their decisions, the more they can tailor their grieving and healing process, the more many of them want to find ways to help change the current stillbirth status quo. The more the public is aware of the issues, the better the community as a whole can respond.

GLOBAL PERSPECTIVES

O5 - Stillbirths and WHO

Monir Islam

WHO - Making Pregnancy Safer

For various reasons stillbirth still remains to be counted! Globally there are about 3.5 million stillbirths every year. 90% of these stillbirths are occurring in developing countries. Countries in Africa and Asia contributing to these deaths the most. There are difference within regions, countries and within the same country. There are differences between urban and rural areas, between rich and poor. Many countries have managed to reduce the prevalence of stillbirth, significant experience and evidence have been accumulated in what needs to be done. Yet, countries need to conceptualize this public health problem and tragedy, develop appropriate strategy and investment. Political commitment will be needed for this investment. WHO's Making Pregnancy Safer Department consider stillbirth as an indicator for performance of health care services delivery system. Every women should have access to information and quality care before pregnancy, during pregnancy and childbirth to improve the situation to make sure every pregnancy ends with healthy newborn and mothers. WHO is working with countries in assessment, policy formulation and strategy development, building national capacities and monitoring progress. Other important areas for WHO's involvement is in advocacy at global, regional and country levels to raise the issue of this public health tragedy , and to secure political commitment for adequate investment.

O6 - Stillbirth in developing countries

Robert L. Goldenberg (USA)

Department of Obstetrics/Gynecology, Drexel University College of Medicine, Philadelphia, USA

Stillbirth (SB) rates range from 3 - 5/1000 births in developed countries to 30 to 50/1000 births in many developing countries, to over 100/1000 births in some specific areas of these countries. There are likely 5 million SB world-wide with the vast majority (98%) occurring in developing countries. In those areas, SB out-number neonatal deaths and account for more than 50% of all perinatal mortality. Most developing countries have no registration system for SB so available information about number of SB and its etiology are imprecise. Furthermore, most developing countries use 28 weeks or 1000 gm as the lower gestational age/birthweight cut off. Since many developed countries use lower gestational age and birth weight cut offs, the discrepancies in SB prevalence between developed and developing countries are likely greater than they appear. Leading developing country obstetric causes of SB include obstructed labour, preeclampsia, antepartum hemorrhage and infection. The vast majority of developed country SB are preterm, often very early preterm. In comparison, many developing country SB occur at term or are late preterm. Only about 10% or fewer developed country SB occur in the intrapartum period, while 50% or more of developing country stillbirths are intrapartum. Developing country SB are also more likely to be fresh vs macerated compared to developed country SB. Furthermore, in developed countries, about 25% of SB are associated with congenital anomalies, while in developing countries less than 5% are associated with congenital anomalies. Since so many developing country SB are term or near term, fresh as opposed to macerated, occur in the intrapartum period, and free of congenital anomalies, these data suggest that with appropriate medical care, especially during labor, many of the developing countries SB are preventable by better access to appropriate obstetric care.

O7 - Implementing perinatal mortality reviews

D S Manandhar

Department of Paediatrics, Kathmandu Medical College, Nepal

Nepal's latest perinatal mortality rate (PMR) of 45 per 1000 births is one of the highest in the world. Perinatal death review is an important process to identify avoidable factors and in reducing PMR

Aim: The main aims are to find out main causes of perinatal deaths and perinatal death review process in Nepal

Methods: Perinatal death reviews carried out in different hospitals, national survey reports and occasional reports published in medical journals are included

Results: Only few hospitals in Kathmandu carry out regular perinatal mortality reviews. While hospital reports show a declining trend in PMR, the latest national survey data has shown only a slight reduction from 47 to 45 per 1000 births since the previous one done 5 years ago. Wigglesworth's classification of perinatal deaths is generally used for classifying perinatal deaths. Macerated stillbirths are more in number than fresh stillbirths and the main causes of early neonatal deaths are asphyxia, infection and prematurity.

Discussion: As perinatal death review is an important process in preventing avoidable perinatal deaths, this process should be made in all hospitals where births occur. Recently the Family Health Division of the Department of Health Services has taken an initiative to start such reviews in other hospitals of the country. Perinatal death review forms are being developed so as to make the review process uniform and comparable in the country.

Conclusion: Regular perinatal death review in institutions would help in identifying avoidable factors and thus help in reducing perinatal deaths. This process which is carried out only in few hospitals now needs to be expanded in all hospitals where babies are delivered.

O8 - Taming perinatal mortality by catering the rural population through satellite maternity centers

S Guruvare, Lavanya Rai

Kasturba Medical College, Manipal, India

Introduction: Perinatal mortality in India still remains high. Within the country, there is regional variation in the perinatal mortality rates due to a large divide between urban and the rural health care systems. Connecting these two systems by an effective referral facility will contribute to the betterment of perinatal outcome.

Setting Tertiary Care Hospital in rural South- West India and the attached Satellite Maternity Homes

Protocol: The six satellite maternity homes attached to the nodal hospital are placed at different locations within a radius of 30Km. At these centers maternity care is provided by the residents posted rotationally and the two each trained auxiliary nurse midwives placed permanently. All the low risk pregnancies are managed at the centers whereas the high risk cases are referred. Besides, the nodal center receives referred cases from within the district and the neighboring districts.

In this study, an audit of perinatal mortality was conducted from May 2006 till April 2007. The mortality was compared with that in the other regions of rural India.

Outcome: In the study group, between May 2006 and April 2007, nearly half (49%) of the total births were at the satellite centers and 92% of these were attended by the residents. There were 16% intrapartum referrals and 21% of the women were referred antepartum.

The perinatal mortality rate was 21/ 1000 live births. Two third (63%) of the perinatal deaths were stillbirths and a third (37%) neonatal deaths. Seventy seven percent of the perinatal deaths were preterm and 90% of the babies weighed less than 2500 g. Preeclampsia-eclampsia (40%), fetal growth restriction (20%) and placental abruption (14%) were the leading factors associated with perinatal deaths. Two third (69%) of the perinatal deaths were among the women referred from the hospitals other than the satellite maternity centers. Seventeen percent of the perinatal deaths were among the women referred from the satellite maternity centers and 14% were among those booked at the nodal center.

The perinatal mortality in the study was much lower than the national average (70 per 1000 live births, WHO 2007).

Conclusion: The study highlighted the responsibility of the tertiary care centers in connecting with the rural health systems, thereby improving the perinatal outcome.

O9 - Sociodemographic inequalities in perinatal mortality among singletons in North East Tanzania: Registry based study

Ndema A Habib[1, 2], Rolv Terje Lie[1], Olola Oneko[4], John F Shao[4], Per Bergsjø[3], Anne Kjersti Daltveit[1]

[1]Department of Public Health and Primary Health Care, University of Bergen, Norway; [2] Department of Epidemiology and Biostatistics, Muhimbili University College for Health Sciences, Tanzania; [3] Norwegian Institute of Public Health, Division of Epidemiology, Oslo, Norway; 4 Department of Obstetrics and Gynaecology, Kilimanjaro Christian Medical Centre, Tanzania

Introduction: Sub-Saharan Africa has the highest known perinatal mortality rates. Few studies have assessed how differences in sociodemographic conditions affect perinatal mortality within this region. The aim of the study is to estimate variation in perinatal mortality by inequalities in parental sociodemographic factors.

Design and settings: A registry based study using births during 1999-2006 time period born at a hospital in North Eastern Tanzania.

Participants and methods: 14 394 singleton births with birth weight 500 grams and a known perinatal survival status. Births of women with residence outside the local district who were referred to the hospital for delivery for medical reasons were excluded.

Results: Perinatal mortality was 41.1 per 1000 births. Factors independently associated with higher perinatal mortality were: older paternal age (>45) compared to age 26-35 (Adjusted Relative Risk [ARR]= 2.0; 95% Confidence Interval [CI]: 1.4, 2.8), low paternal education (primary) compared to secondary or higher (ARR=1.3; 95%CI: 1.1, 1.7), paternal tribe other than Chagga or Pare (ARR=1.4; 95%CI: 1.1, 1.7), paternal farming occupation (ARR=1.5; 95%CI: 1.1, 2.2), maternal service occupation (ARR=1.7; 95%CI: 1.2, 2.6), maternal height 150 centimeters or lower (ARR=1.4; 95%CI: 1.0, 1.8) and residence in the rural or semi-urban area(ARR=1.4; 95%CI: 1.1, 1.7).

Conclusions: Inequalities in perinatal mortality due to parental sociodemographic variations exist in Africa. Paternal social factors have stronger independent influence on perinatal mortality compared to maternal social and biological factors. This may reflect a pattern of social or cultural influences on perinatal mortality.

UNDERSTANDING STILLBIRTH THROUGH AUDIT

O10 - Perinatal audit in South Africa

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South Africa uses two systems to describe perinatal care, namely the District Health Information System (DHIS) and the Perinatal Problem Identification Programme (PPIP). The DHIS is becoming more reliable and captures the births and deaths of babies in all health institutions. PPIP is an outcome based audit system that records all births and deaths of babies, allocates the pathological causes of deaths and describes the avoidable factors, missed opportunities and suboptimal care involved in each death. It is primarily aimed at improving the quality of care in the institutions using it. Sites use PPIP voluntarily, but are encouraged to do so by their provincial health authorities. PPIP users record approximately twenty percent of all births currently. The last perinatal care survey (2003-2005) using PPIP analysed 576065 births, 14001 stillbirths and 6872 early neonatal deaths.

The causes of stillbirths are classified using a modified Aberdeen Classification system. All stillbirths are further classified into alive on admission but stillborn; fresh stillbirth but dead on admission; macerated; and stillborn, admission status unknown. For convenience stillbirths that were macerated were regarded at antenatal deaths and fresh stillbirths were regarded as intrapartum deaths.

The Perinatal Mortality rate was 37.5/1000 births (≥500g); the Stillbirth Rate 24.3/1000 births; and Early Neonatal Death Rate was 12.2/1000 births. Fifty-four percent of the stillbirths were macerated, 40% were fresh stillbirths and 6% were unclassified. More than half of the macerated deaths were classified as unexplained, with hypertension being responsible for 17%. The major causes of fresh stillbirths were intrapartum asphyxia and birth trauma (IPA&T) 23%, abruptio placentae (22%) and unexplained stillbirths (18%). IPA&T accounted for half of the deaths in fetus's ≥ 2500g, whereas abruptio placenta was the most common cause between 1000g and 2499g, accounting for a third of the deaths.

A third of the deaths due to IPA&T were thought to have been probably avoidable had the health care provider acted differently. The major factors related to poor fetal monitoring (36%), poor use of the partogram (10%), poor management of the second stage (9%) and delay in calling for assistance (6%). These results were used to develop and introduce a set of intrapartum care guidelines that have been adopted a policy throughout South Africa.

Similar analyses can be performed for any disease category, group of babies, specific avoidable factors and so on, so that ideas can be generated to solve specific problems based on data. Further, monitoring the impact of specific interventions can also be achieved using perinatal audits.

O11 - Factors associated with unexplained antepartum fetal death in singleton pregnancies in Australia

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Introduction: Unexplained Antepartum Fetal Death (UAFD) accounts for approximately 30% of all stillbirths in Australia, occurring at a rate of 2 per 1000 births; ten times the rate of Sudden Infant Death Syndrome (SIDS). The primary aims of this study were to determine the maternal, fetal and pregnancy related factors associated with unexplained antepartum fetal deaths (UAFD) and to examine the contribution of fetal growth restriction.

Methods: We undertook a population-based retrospective case control study of singleton pregnancies over a four-year period 2000-2003 in three States (Queensland, Victoria, and Western Australia). Cases were antepartum fetal deaths classified as Unexplained antepartum fetal death according to the Perinatal Society of Australia and New Zealand Perinatal Death Classification (PSANZ-PDC). Two control groups were used: 1) explained antepartum fetal deaths; and 2) a random sample of healthy liveborn term infants. Exclusions were births <22 weeks and/or 500gms and stillbirths classified as Congenital abnormality. Data were extracted from the medical records. Fetal growth restriction was determined using customised birthweight centiles. Risk factors were examined through multivariate analysis.

Results: The study sample was drawn from the population 532 528 singleton births (22 weeks/500gms) occurring over the study period in the three States. The sample included all antepartum stillbirths (excluding stillbirths with Congenital abnormality), resulting in a sample of 1487 stillbirths: 801 UAFD (1.5/1000 births) and 686 Explained fetal deaths. 993 (67%) stillbirths were classified as either UAFD or FGR. The overall rate of autopsy rate was 45%; UAFD 44%, Explained stillbirth 45%. Results of multivariate analysis will be presented.

Conclusions: This large population based study has shown a rate of unexplained stillbirth in singleton pregnancies of 1.5/1000births; over half of all stillbirths without major congenital abnormalities. The contribution of unexplained stillbirths increased to almost 70% when the category of unexplained stillbirths with associated FGR were included.

O12 - Socio-economic inequalities in Stillbirths in N Ireland 1993-2002

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Introduction: Recent statistics show that stillbirth rates in the UK remain as high as ever. This paper reports part of a project exploring trends in socio-economic inequalities in pregnancy outcome, including stillbirth, in Northern Ireland.

Methods: The project uses routinely collected data; Registrar General data and Child Health System. Matching of the files was required to obtain all required risk factors (maternal age, multiplicity, social class and registration by mother only). Deprivation indices for small areas were linked into the data via the postcode of residence. Among the 233, 782 registered births there were 1, 293 registered stillbirths. Statistical analysis was undertaken using Poisson regression.

Results: In Northern Ireland the stillbirth rate has changed little between 1993 and 2002 with rates of 5.1 per 1, 000 total births and 5.5 per 1, 000 total births respectively. The risk of stillbirth is higher for under 20 year olds (IRR 1.17; 95% CI 0.93 to 1.46) and 40+ (IRR 2.69; 95% CI 2.07 to 3.50). The risk for multiple births was almost three times that of singleton births (IRR 3.13; 95% CI 2.54 to 3.85). There is a clear social gradient in the risk of stillbirth with 42% more stillbirths occurring in the most deprived quintile (IRR 1.42; 95% CI 1.19 to 1.69). Births to older maternal age and multiple births are negatively associated with deprivation and adjustment for these risk factors slightly increases the effect of deprivation (Adj IRR 1.47; 95% CI 1.23 to 1.76). Sole registration did not increase the risk of stillbirth.

Conclusions: Low socio-economic status, advanced maternal age and multiplicity are all associated with increased risk of stillbirth.

O13 - Perinatal mortality, ethnicity and social deprivation

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While the UK has an established method of collecting information on all stillbirths and neonatal deaths, the interpretation of causes and trends is difficult without proper denominator data with characteristics of all pregnancies. Such data collection has been recently commenced in the Birmingham and the Black Country, an area with approx 30,000 maternities per year characterised by high perinatal mortality.

The information recorded includes demographic characteristics such as ethnic origin, deprivation index, teenage pregnancy and obesity. In addition, basic performance indictors of the maternity service are collected, including early booking, continuity of carer, detection of fetal growth restriction, smoking cessation and initiation of breastfeeding. Such information is able to show where there is a shortfall of these targets, and which subgroups need a special focus for enhancing the service and making it more equitable.

The data demonstrate significant links between deprivation and perinatal mortality. Analysis of year-on-year trends furthermore shows that, contrary to national targets, this inequalities gap is getting bigger. There are also significant associations between ethnicity and perinatal mortality, with a 1.5 - 2 fold risk for mothers from African Caribbean and South Asian (Pakistani and Indian) backgrounds compared to their British-European counterparts. When deaths due to congenital anomalies are excluded, these differences persist for African Caribbean but not South Asian mothers. Such findings are leading to a current focus on the causes of perinatal death in different ethnic groups, including the effects of consanguinity.

The collection of standardised data from all pregnancies is key to a better understanding of ethnicity, deprivation and other risk factors for adverse pregnancy outcome, and is fundamental to direct the service enhancements needed to address these challenges.

FETAL ACTIVITY AND GROWTH

O14 - Femina - The epidemiology of decreased fetal movements

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Introduction: "Normal" fetal activity is recognized as a sign of fetal well-being, and concerns for low fetal activity is a frequent cause of non-scheduled antenatal visits, thus consume significant health care resources. The frequency, management and outcomes of this category of the obstetric population have not been closely evaluated. The aim of this study was to describe the epidemiology of these pregnancies.

Materials and methods: 2348 cases examined for concerns of decreased fetal movements (DFM) in the third trimester were prospectively registered in 14 hospitals in Norway, from a total population of 38728 singleton pregnancies in the same period. Control pregnancies that had never been examined for DFM were collected as a cross-sectional sample from the same population (n=614).

Results: Of 38 728 pregnancies, 6.5 % were examined in hospital for concerns for DFM. Eighty-five percent of the concerned mothers contacted health professionals spontaneously while 15 % reported their worries during the scheduled prenatal visit. Case mothers were more often obese, smokers and primiparous Pathology was identified in 16 % of examinations. Consequences of the visits were an intervention in 41% of cases in which 13 % were admitted to hospital. Forty-six percent presented preterm. Being affected by DFM resulted in a suboptimal pregnancy outcome in 28 %, including preterm birth and fetal growth restriction (FGR). There were a total of 95 deaths (4.1 %) among pregnancies presenting with DFM. Eighteen (19 %) presented with a living fetus when they were examined for DFM at the hospital of which 14 would die later at term. Twenty-six percent of the cases had waited for more than 24h with a perception of absent fetal movements. No guidelines for management existed in the 14 hospitals.

Conclusion: Pregnancies affected by DFM represent risk pregnancies. Guidelines for management and information to pregnant women are needed.

O15 - A prospective study of pregnancies with Decreased Fetal Movement (DFM)

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Introduction: We undertook an observational study to assess outcomes of pregnancies with DFM in an effort to identify potential strategies to reduce the incidence of stillbirth.

Methods: We undertook an IRB approved study of pregnancies 28 weeks gestation or greater from April 1, 2005 to June 30, 2006. Women who reported DFM were identified. Information on the length of decreased fetal movement and follow-up evaluation were collected. The outcomes of these pregnancies were obtained from the medical record.

Results: Among the 13, 331 births that took place 498 women (3.7%) presented with DFM. Identifiers were not available for 22 cases leaving 476 cases for review.

The majority of women (60%) called their provider to report DFM using their own judgment, 29% reported this in the context of their usual visit and 3.2% used a kick chart. The duration of DFM ranged significantly; 31% waited less than 24 hours, 19% waited 24 hours, 50% waited from 2 to 17 days before contacting their provider. Once contacting their provider, 50% of patients were evaluated within one hour.

Seven percent of patients were admitted for observation or for induction of delivery. Six percent of newborns were admitted to the neonatal intensive care unit after delivery. The stillbirth rate among those who had a consultation for decreased fetal movement was 16.9/1000 which was 4.1 fold higher than the total population rate of 4.6/1000. Among the deaths that occurred in this population, 44% were severely growth restricted (below fifth percentile) using customized growth charts.

Conclusions: This study confirms that the history of DFM is a significant risk factor for stillbirth. Optimal management should include an evaluation for fetal growth using customized growth charts. We emphasize the need to increase the education of providers and mothers regarding the importance of fetal movement and the use of kick charts as a simple way of promoting attention to fetal movement.

O16 - Risk Factors for fetal growth restriction

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Only 20 - 50 % of small for gestational age (SGA) babies are currently diagnosed before birth and about half of stillborn babies have a birthweight < 10th customised centile and therefore likely suffer from fetal growth restriction. Whilst it is uncertain whether suboptimal growth is the cause of death it is certainly an important association. Strategies to increase antenatal detection of suboptimal fetal growth have the potential to reduce perinatal morbidity and also mortality. Such strategies include early identification of women at high risk, accurate clinical assessment of fetal growth using customised growth charts and appropriate use of ultrasound.

A range of clinical risk factors are associated with SGA babies including demographic factors: smoking >10 cigarettes/ day, maternal age ≥ 35, new partner, woman born SGA, partner born SGA, nulliparity, unemployed;

Obstetric history: previous SGA baby, previous stillbirth, ≥ 2 miscarriages:

Medical history: chronic hypertension, renal disease, antiphospholipid syndrome.

However currently there are no screening tests that enable reliable prediction of SGA pregnancies. Uterine artery Doppler studies in mid pregnancy have limited utility for prediction of SGA. Low levels of PAPP-A in first trimester serum are associated with a 2-3 fold increase in later SGA but neither perform well enough in isolation to be recommended as a screening test. The SCOPE study which is recruiting nulliparous women in Auckland and Adelaide, as well as centres in the UK, aims to develop a reliable early pregnancy screening test for both SGA and preeclampsia using a combination of clinical, biochemical + Doppler variables and if successful will result in accurate risk prediction for future women.

A recent large study of nulliparous pregnancies (with major congenital abnormalities excluded) has shown that 85% of customised SGA babies were born at > 37 weeks. The implications of these findings for practice are that growth scans, in women at risk of SGA, should be performed (or continued) late in the third trimester.

O17 - Confidential Enquiries into Stillbirths with IUGR

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Background & Aim: Fetal growth restriction has been identified as the single largest category of conditions associated with stillbirth. The Perinatal Institute was commissioned to conduct a confidential enquiry into stillbirths with growth restriction, as part of the Birmingham and Black Country 'Reducing Perinatal Mortality Project'.

Method: The cohort consisted of a consecutive series of notified stillbirths within the Birmingham and Black Country area which had evidence of intra-uterine growth restriction, diagnosed either antenatally, by post-mortem, or by a birth weight below the 10th customised percentile. Lethal congenital anomalies and births below 30 weeks gestation ere excluded. Cases were anonymised and examined in batches of four in monthly confidential enquiry panels, each including two consultant obstetricians and two senior midwives from outside the area of investigation. Following a special proforma, all aspects of the antepartum, intrapartum and postpartum care were discussed and the standard of care was evaluated and graded, using conventional CESDI Grading.

Findings: 7 panel meetings were convened between Nov 2006 and May 2007, resulting in review of 28 cases.

Grade 0	No suboptimal / substandard care	**1**
Grade 1	Suboptimal care, but different management would have made no difference to the outcome	**3**
Grade 2	Suboptimal care; different care might have made a difference (possibly avoidable death)	**16**
Grade 3	Suboptimal care; different care would reasonably be expected to have made a difference (probably avoidable death)	**8**

Overall, 24 of 28 cases (86%) were Grade 2 or 3 - i.e. where the death was considered potentially avoidable.

Most frequently, panels commented on the following areas:

- There was often a lack of appropriate risk assessment and management plan, resulting in high-risk pregnancies not receiving the intensive surveillance warranted.
- Where risk factors were identified, there was evidence of insufficient follow-up or long gaps between serial scanning, with unit protocols often either inadequate or not followed.
- There was often no or incorrect use of customised charts and measurement and plotting of fundal height
- Many adverse outcomes resulted from mistakes and discontinuity of care which panels felt were likely to have resulted from work overload and understaffing.
- Postnatal care including bereavement support varied considerably and was often substandard.

Conclusion: There was a strong association between stillbirths with intrauterine growth restriction and substandard care, with 6 out of 7 deaths considered potentially avoidable. There is an urgent need for better training, standardised protocols, and enhanced resources to avoid deaths associated with fetal growth restriction.

WORKSHOP: DEFINITIONS

O18 - What defines a stillbirth depends on where you live: an overview of international stillbirth definitions

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The World Health Organization (WHO) defines stillbirth as a "fetal death late in pregnancy" with individual countries left to define the gestational age at which a miscarriage becomes a stillbirth. The "perinatal period" is defined as ≥22 weeks of gestation (154 days) or, if the gestational age is not known, to include infants with a weight of 500 grams or more and ends seven days after birth.

There is significant variation in the gestational age at which a pregnancy loss is defined as either a stillbirth or an abortion. The country specific definition determines when the birth outcome will be registered as a birth, a death, or both. Since the gestational age of viability varies tremendously if a baby is born in a developing or developed country, one can expect that lower limit that defines a "birth" and therefore stillbirth also varies significantly. In a country with limited resources were record keeping in remote areas may be completely lacking, the "sixth month" or 28 weeks has been used. For international comparisons, it has been useful to compare losses after 28 weeks because the estimates are more accurate than with lower gestational age definitions. Some developed countries such as Sweden find themselves with outdated definitions. They must deal with the paradoxical situation that since the improved survival of premature babies. it is not uncommon that if a baby is born alive at 27 weeks it is registered but if it is born dead it is not. The issue of abortion also plays a hand in a countries approach to birth registration. When "death" is defined, it inherently defines "life". Again countries must struggle with the situation that a fetus might be electively terminated at a gestational age above which a moderate numbers of babies might be expected to survive if spontaneously birthed. Another grey area of definition includes the inevitable abortions with ruptures membranes in the pre-viable fetus. There are many countries that if the pregnancy is managed proactively with induction or augmentation (to reduce the risk of sepsis in the mother) the loss would be classified as an abortion if born dead, but if she is managed expectantly, her baby would be registered as a stillbirth.

Still there is reason despite all of these complex issues and varying levels of resources to strive to adopt an international definition of a stillbirth. A definition would help to more accurately describe these deaths that remain as important in Africa as they do in the Americas. It gives the opportunity to "set the bar", to make goals. Of course selecting a lower age of gestation will make data collection more difficult and less accurate, but it does improve the data collection at higher gestations. If you could choose a definition, what would it be?

O19 - The use and misuse of stillbirth rates

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The effects of the changing pattern of intrauterine deaths (defined as stillbirth events) on stillbirth rates will be presented using congenital anomalies as an example. Selective Canadian data will demonstrate how termination of pregnancy impacts the pattern of stillbirths and stillbirth rates. Stillbirth rates corrected for congenital anomalies will be presented, with discussion on how these can be used or misused.

This information will be a catalyst for discussion on factors influencing stillbirth rates internationally: including, the availability of prenatal diagnosis, society's tolerance for termination of pregnancy, and variations in interpretation of stillbirth definitions. The benefits to reporting stillbirth rates including and excluding stillbirths with lethal anomalies and terminations of pregnancy for congenital anomalies will be raised. Recommendations for international reporting standards may be an outcome of the discussion. In addition, Canada's approach to achieving consistency in the registration of stillbirth events will be presented for information.

O20 - When definition issues collide with abortion issues - Social political ramifications of different definitions of "child"

Inge Radestad

In everyday life we use the word "child" without difficulty. Everybody knows what we mean when we speak about a "child" or "children". Yet there are situations where the term "child" has to be defined very carefully. These situations arise, for example, in connection with medical and legal issues concerning the perinatal period. The Swedish legal definition of "child" differs in some respect from definitions such as those used by the World Health Organization or in other countries. The term "child" is not applied in Sweden to stillborns before the end of the 28th week. In cases in which a non-viable baby is delivered before the 28 week gestational age; the delivery is considered as a miscarriage. This designation has important economic consequences for the woman.

You may ask why Sweden still uses a definition that first was used in the 1940s when it simply was not possibly to save a baby born before the end of the 28th week. The answer is mostly to be found in Swedish abortion law. Sweden allows abortion to be freely chosen up to and including the 18th week of pregnancy. This means that the mother-to-be has right to herself chosen to break off the pregnancy. After the 18th week, the woman must obtain permission from the legal adviser at the National Board of Health and Welfare. This provision of Swedish abortion law which has been in effect since 1975, states that the foetuses may not be aborted if it can live - be viable - outside the womb. Since the beginning of 1980, debate articles appeared in both newspapers and professional journals noting that the Swedish legal definition of "child" was not entirely logical.

In 1994 the Swedish Society of Obstetrics and Gynaecology sent a proposal to the Ministry of Health and Social Affairs proposing a change in Swedish birth-registration law, specifying that the limit should be changed from 28 to 22 completed weeks of pregnancy. The Ministry of Health and Social Affairs consulted the National Board of Medical Ethics for a statement. Three years went by before the statement was issued that contained the following: *The possible benefits of any change must be weighed against the consequences of a lowering of the limit in birth-registration law, which will result in a conflict with abortion law. A change in the birth-registration law results in a situation in which society presents conflicting views concerning what is to be regarded as a child.* The Ministry of Health and Social Affairs archived the proposal from the Society for Obstetrics and Gynaecology and with the statement from the National Board of Medical Ethics without making any changes. As a result, the Society for Obstetrics and Gynaecology sent yet another letter in 1999, five years after their first letter, with the same aim: Lower the limit at which the term "child" shall be used. That letter also led the Medical Ethics Committee to express itself again. The Committee changed its view and wrote: *Women who give birth after 22d week of pregnancy do not ordinarily regard the foetus as a miscarriage but as a child, and they take the position that birth-registration law should state that after the 22d week a child is to be registered.* In 2002 the Swedish government rejected the recommendation. The government justified its decision by noting that it already was possible to arrange burials of a stillborns born before the 28th week of pregnancy, and therefore no change in the law was needed. Today, a change in the Swedish law may well be underway.

PLACENTA: STRUCTURE AND FUNCTION

O21 - The perinatal autopsy: pertinent issues in multicultural Western Europe

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Western Europe is in a demographic transition with increasing multicultural societies. Health professionals have to understand the background, religious and cultural sensitivities to the autopsy of parents to counsel them regarding an autopsy in the event of a perinatal loss. Autopsy rates have declined over the past decades, the major limiting factor being the granting of permission for an autopsy, possibly because of adverse publicity or reluctance of doctors to obtain consent1. The autopsy has been proven to be important in revealing unsuspected findings, resulting in different strategies for prevention of perinatal loss. Amongst the major religions there is actually no proscription against the performance of an autopsy. Different burial and cremation ceremonies between religions should however be kept in mind for timing and procedure of the autopsy. Some parents may not consent for a complete autopsy. Thorough macroscopic examination by a pathologist, with or without limited autopsy can be an alternative. Also needle biopsy and imaging techniques may reveal important findings. Placental autopsy has been proven to be useful, and no religious proscriptions against placental investigations have been described. The "organ retention" controversy should be discussed in the counselling regarding the autopsy. The reason for the retention, the fact that as minimal tissue as possible will be retained and the procedures of tissue fixation can be explained.

Conclusion: Autopsy is an integral part of perinatal care and management in cases of perinatal mortality. The public can be convinced of this utility by means of good information notwithstanding their religious or cultural background. With clear written and oral information on the autopsy against the cultural, religious and personal backgrounds the autopsy rates may be raised again.

O22 - Value of placental examination in the absence of postmortem consent

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In 2005 and 2006 we had 178 perinatal deaths. In 117 cases (65.7%) no consent was given to a post mortem, out of which 90 were included in this study. 79 singleton (IUD 42 NND 35 TOP 2), and 11 twin or triplet placenta reports were analysed.

Placenta weight centile, diagnosis, given clinical information and usefulness of the reports were recorded. The overall placenta weight centile (PWC) was 10.8, compared to those where the fetal weight was under 10th centile and the PWC scored 3.8 (v.s. body weight centile > 10th centile and PWC=18.6). The gestational age specific body /placenta weight ratio was also elevated.

The study included 27 histologically normal placentas and 18 small placentas (_45) with no major histological findings. In this group 29 perinatal deaths were clinically unexplained and pathology gave in 21 (47%) explanation or valuable information.

Clinically unexplained or no appropriate clinical information was given in 38 cases (48%) out of which histology appeared to be useful in 25 (65.8%) [in "unexplained" 58% and in "no clinical information" 100%]. Not surprisingly in case of fetal malformation (25) 56% had normal or irrelevant histological finding.

In contrast, after excluding those, where the placenta was normal, or was small with no significant lesion, clinically 53% of the cases were unexplained and histology gave relevant explanation in 27/34 (79%). Among the histologically explained 27 cases 14 (52%) were clinically unexplained.

In conclusion irrespectively whether there is consent to the autopsy of a stillborn baby, it is mandatory to examine the placenta as it bears essential information. The placenta histology will give the cause of intrauterine death in a high number in case of a meticulous workup. Based on the diagnosis maternal tests can be indicated, or clinicopathological correlations can be identified.

O23 - Placental causes in 750 intrauterine deaths

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Introduction: Placental causes of death account for up to 60% of perinatal mortality cases. For intra uterine-fetal death's (IUFD) specifically this is unknown. Our objective was to study placental causes of death in an IUFD cohort.

Methods: In a Dutch multi-centre study on IUFD, during a 5 year period (2002-2007) we studied 750 singleton deaths > 20 weeks of gestation for which the diagnosis of IUFD was determined before labour. Panel classification of cause for 750 IUFD's according to the Tulip classification was performed by assessors after individual investigation of structured patient information. Placental subcategories were defined as placental bed pathology, inadequate spiral artery remodelling and/or spiral artery pathology leading to uteroplacental vascular insufficiency; developmental pathology, morphologic abnormalities that arise because of abnormal developmental processes; parenchyma, acquired placenta parenchyma disorders of the villi or intervillous space; abnormal localisation; umbilical cord complication or not otherwise specified (NOS), multiple placental causes.

Results: A placental cause was determined for 489 (65.2%) deaths. Placental bed pathology was allocated in 248 (50.7%) IUFD's with a placental cause, origin of mechanism was abruption in 52 (21.0%) of these deaths, infarction in 193 (77.8%) and both in 3 cases. Developmental pathology was observed in 130 (26.6%) cases, largest subcategories were placental hypoplasia (n=92, 70.8%), villus immaturity (n=32, 24.6%) and both in 4 deaths. Parenchyma disorders caused death in 23 (4.7%), origin of mechanism was fetal thrombotic vasculopathy (n=2), villitis of unknown origin (n=5), fetal maternal haemorrhage without obvious cause (n=9) and massive perivillous fibrindeposition (n=7). Umbilical cord complications caused death in 39 (8.0%) IUFD's and placenta NOS in 49 (10.0%).

Conclusion: Placental causes of death account for 65% of IUFD's. Due to the diversity in the placental subcategories further subclassification and clear definitions are needed for retention of information, specific counselling on recurrence risks and targeting adequate preventive strategies.

O24 - Placental fetal vascular changes diagnostic for cord accident in unexplained stillbirth

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Introduction: As many as 50% of stillbirths remain unexplained after fetopsy and placental examination in published series. Fatal hypoxic injury due to restriction of umbilical blood flow ("cord accident") may be causal in a subset of these stillbirths. Although indirect diagnostic support may come from clinical report of a tight nuchal cord or from gross cord abnormalities such as true knots, pathologically, "cord accident" remains a diagnosis of exclusion, primarily due to lack of established histologic criteria. We set out to identify such criteria for the diagnosis of cord accident.

Methods: We performed a retrospective review of charts and placental slides of 62 cases of third trimester stillbirth. Per the autopsy reports, 10 were designated cord accident, 27 had cause of death other than cord accident, and 25 were unexplained. The 10 cord accident cases all had strong clinical or gross evidence of cord compression and were used to define histologic criteria, which were then tested against the remaining 52 cases.

Results: All 10 cord accident cases displayed the following histologic changes (criteria for cord accident): 1) vascular ectasia and thrombosis within the umbilical cord, chorionic plate, or stem villi, and 2) regionally distributed avascular villi or villous stromal karyorrhexis. Of 27 stillbirth cases with cause of death other than cord accident, only 3 met the histologic criteria for cord accident, for a specificity of 89%; requiring the additional presence of nuchal cord or potentially obstructive gross cord abnormality increased specificity to 96%. Of 25 stillbirth cases with unknown cause of death, 13 (52%) met the histologic cord accident criteria (P<0.025).

Conclusion: Histologic diagnosis of cord accident can be made with confidence using well-defined criteria. This is the first study to establish such criteria, the application of which can substantially reduce the proportion of unexplained stillbirth.

O25 - Markers of placental function and the risk of stillbirth

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A large proportion of stillbirths are caused by placental dysfunction. In the case of abruption the role of placentation is self evident and in the case of pre-eclampsia, there are many lines of evidence that link the disease to placentation. Moreover, it is estimated that approximately half of otherwise unexplained stillbirths have a birth weight less than the 10th percentile corrected for gestational age and parental characteristics. Poor fetal growth, in the absence of other environmental causes, is assumed to reflect poor function of the placenta. Consequently, biochemical and ultrasonic tests of placental function and development are associated with the risk of stillbirth. The association between stillbirth risk and several placental markers of stillbirth risk will be discussed, including low maternal serum levels of pregnancy associated plasma protein A, elevated maternal serum levels of alpha-fetoprotein and human chorionic gonadotrophin, and high resistance patterns of uterine artery Doppler flow velocimetry.

POSTMORTEMS AND ANOMALIES

O26 - Do autopsies improve reports of congenital malformations among stillbirths?

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Background: Birth defects are recognized contributors to stillbirths. Although the perinatal autopsy has proven useful in determining or confirming the presence of a birth defect, many stillbirths often have inadequate post-mortem evaluations. Thus, the information available for assessing possible causes of death may be limited. This study uses data from a birth defects surveillance program to determine whether an autopsy improves the detection and confirmation of defects among stillbirths.

Methods: Cases of birth defects among live births and stillbirths during the period 1968-2003 were obtained from the Metropolitan Atlanta Congenital Defects Program (MACDP). MACDP is a birth defects surveillance program that actively monitors the occurrence of malformations among offspring born to mothers residing in the five central counties of Atlanta. A stillbirth was defined as an intrauterine death occurring at 20 or more weeks of gestation. Stillbirths with an autopsy were compared to those without an autopsy with respect to the median [with interquartile range (IQR)] number of total, confirmed and possible malformations. Malformations were also stratified by major and minor defects.

Results: Of the 40864 infants/fetuses with structural defects in MACDP during the study period, 1051 (2.6%) were stillbirths. Sixty-six percent of stillbirths underwent autopsy (n=694) and of those, autopsy results were available for 407 (58.6%) of cases. The median number of total malformations reported increased from 1 (IQR=1) in stillbirths without autopsy to 3 (IQR=4) in stillbirths with autopsy, and confirmed major malformations increased from 1 (IQR=1) to 2 (IQR=2). Increases were also seen in the number of confirmed minor malformations. Additionally, a corresponding decrease in the number of possible major and minor malformations was observed among stillbirths undergoing autopsy compared to stillbirths without autopsy.

Conclusions: Having an autopsy resulted in an increase in the number of confirmed major and minor malformations and a decrease in the number of possible malformations among stillbirths.

O27 - Anomalies as a cause of high perinatal mortality rate in multi-ethnic communities

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The Perinatal Institute administers a population-based fetal loss & infant death register and a congenital anomalies register that covers the whole of the West Midlands. This health region is one of the most ethnically diverse in England, with 11.3% of its population being non British/European.

Stillbirths and neonatal deaths were analysed over a 10 year period (1995-2004) from a birth population of 646,342. Cases were assessed by maternal ethnic group and cause of death, together with information from postmortems where available.

Results show a marked variation in mortality rates across different ethnic groups, with highest rates in the Pakistani population. This group also had the highest category of deaths associated with congenital anomalies. More detailed analyses reveal excess rates of lethal anomalies of the central nervous system and inborn errors of metabolism. At the same time, Pakistani and other South Asian groups had the lowest uptake of antenatal screening, termination of affected fetuses, and postmortems.

Such findings pose specific challenges for addressing inequalities in perinatal outcome, and have implications for further research, public health policy and education.

O28 - Postmortems in the diagnosis of growth restriction

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Intrauterine Growth Restriction (IUGR) is common in stillborn infants. Using customised growth charts, some 50% of stillborn infants are below the 10th centile.

Post mortem is an important tool for identifying / confirming growth restriction, assessing its severity and identifying the cause.

The post mortem body weight centile is a guide to fetal growth. Fluid loss after birth, occasionally leads to a falsely low centile, although the majority of IUGR stillbirths fall below the 1st centile by birth weight and weight at post mortem. Elevation of the brain- to - liver weight ratio (BLR) - which is normally approximately 3:1 - reflects redistribution of blood flow in IUGR. In a non-macerated stillbirth a BLR of >4 is usually a good indicator of IUGR. An elevated BLR may indicate 'IUGR' in a baby whose weight is above the 10th centile. Maceration reduces the reliability of the BLR, and therefore a higher cut-off of 5 or 6 may be advisable. Since other factors may produce falsely high or low BLR, other evidence of IUGR or intrauterine stress should be sought, such as thymic atrophy, adrenal atrophy, impaired renal growth etc. The extent to which these factors are abnormal allows an assessment of severity of IUGR.

Results: Over a 2 year period, post mortem data from 331 stillborn infants of ≥24 weeks gestation show a body weight below the 3rd centile in 46 %, and 59% below 10th centile. Between 24-28 weeks gestation this rose to 72% below 3rd centile. Overall 51% showed a BLR ≥4 and 20% ≥ 6. This increased to 65% and 35% respectively between 24 and 28 weeks. Of infants with body weight ≤3rd centile, 67% had a BLR ≥4, compared to 35% of those >3rd centile. This fell to 26% of those >10th centile. Thymic atrophy, reflecting intrauterine stress (including IUGR) is shown by increased brain:thymic weight ratio (BTR). The normal ratio is approximately 35:1. In 67% of stillbirths with body weight below the 3rd centile and BLR>4, the BTR is >100:1, compared to 2% of normally grown infants. In stillbirths who are either <3rd centile or have BLR >4, 26% and 15% respectively have a BTR >100:1.

Conclusion: Our data confirm the high incidence of IUGR in stillborn infants, based on customised weight centiles and elevated BLR. They also show that some babies of 'normal' weight may show features of nutritional failure and intrauterine stress as shown by an elevated BLR and/or BTR.

O29 - Review of post mortem bacteriology results in stillbirths in Western Australia 1990-1999

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Introduction: Bacterial Infection is a common "cause" of stillbirth, thought to be usually due to an ascending route, but defining an infectious aetiology is problematic. Bacteria may be isolated due to acquisition in the birth canal, after fetal death, and infection may affect an already compromised fetus. Bacteria may not be isolated due to maternal antibiotics or fastidious culture conditions. We have looked at the epidemiological associations with the identification of bacteria.

Methods: All fetal deaths of at least 400 grams birthweight or 20 weeks gestation occurring in WA between 1990 and 1999 were identified (1825). Cases that had post mortem examinations (53%) and were not terminations of pregnancy (789 cases) were reviewed and classified (using PSANZ) and demographic and clinical data collated. The data were extracted looking at the finding of bacteria in different groups.

Results: 597 (76%) had bacteriological examinations and bacteria isolated in 229 (38%), 45 with two or more isolates. The commonest organisms were E.coli (18%), Group B Streptococcus (15%), Ureaplasma (12%). Bacteriology was more commonly performed in preterm (91%) and Perinatal infection (86%) cases. If chorioamnionitis or funisitis was present (in 15% of cases), bacteria were found in 60% vs. 23% if no inflammation . If macerated then bacteria were less commonly found, 26% vs 38% if non-macerated. Histological evidence of inflammation in the macerated cases was also less common 20% than the non macerated cases 45%. Bacteria were isolated in 15 cases of congenital anomaly as the cause of death.

Discussion: Bacteriology is an important part of post mortem investigations, however the results suggest that positive results need to be interpreted with care. If bacteria are isolated in a macerated fetus without chorioamnionitis they were probably not a factor in the fetal death. Bacteria are associated with non macerated fetal deaths and chorioamnionitis.

INFECTION AND INFLAMMATION

O30 - Stillbirth and infection

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Stillbirths (SB) account for more than half the perinatal mortality in most settings world-wide with rates ranging from 3-5/1000 births in developed countries to 20 to nearly 100/1000 births in some developing countries. Infection likely accounts for about 15% of SB in developed countries to 50% in developing countries. Infection is more strongly associated with early gestational age SB than with late preterm or term SB. There are many mechanisms by which infection may cause SB ranging from 1) severe systemic infection of the mother without fetal involvement, to 2) placental infection, to 3) infections of the fetus causing congenital anomalies, to 4) infections of the fetus causing organ failure and death. Specific infections that are causally associated with SB include malaria, syphilis, Lyme disease, African tick- bourne gestational relapsing fever, listeria, tularemia and typhoid. More important numerically, are the intrauterine infections causing chorioamnionitis, such as placental membrane infections with group B streptococcus, E coli, and the mycoplasmas. Maternal viral infections associated with SB include parvovirus, coxsackie B, varicella, rubella and CMV. The reasons for the high level of infection - related SB in developing countries likely include environmental pressure from large quantities of urogenital organisms plus poor host defenses likely associated with malnutrition.

O31 - Intrauterine inflammation and stillbirth in New South Wales

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Background: In New South Wales stillbirths account for around two thirds of all perinatal deaths with a reported rate of 5.9 per 1000 births in 2005 1. Unexplained deaths comprise 41% and are the most common classification of near term stillbirths 2. Intrauterine infection is a recognised cause of fetal death. It is usually asymptomatic and undiagnosed infection may account for a proportion of unexplained deaths. Intrauterine infection elicits both maternal (chorioamnionitis) and fetal inflammatory responses. There is a lack of population based data on the incidence of intrauterine inflammation and stillbirth.

Aims: To determine the incidence and distribution of chorioamnionitis and fetal response in stillbirth in New South Wales. To examine the relationship of fetal response to spontaneous onset of labour and to unexplained antepartum death.

Methods: State-wide population based cohort study from 2002 - 2004. Records for babies from the Midwives Data Collection and Perinatal Death Database compiled by the NSW Perinatal Outcomes Working Party were linked using probabilistic record linkage methods. Deaths were coded using the PSANZ - Perinatal Death Classification. Placental examination was performed at the local referral centre for the involved Area Health Service. Stillbirths with congenital abnormality and without placental pathology were excluded.

Results: There were 1096 stillbirths without congenital abnormality reviewed by the Perinatal Outcomes Working Party. Of these, 948 stillbirths (86 %) had placental histopathological examination. The incidence of histopathological chorioamnionitis (HCA) was 21%, with a bimodal distribution. A fetal inflammatory response was present in 9.7% and significantly correlated with spontaneous onset of labour («2 =62; df = 1; p < 0.0001). The absence of a fetal inflammatory response was strongly associated with unexplained antepartum death («2 =47; df = 1; p < 0.0001).

Conclusions: This is the first population based study of intrauterine inflammation in stillbirths and is consistent with a hospital based cohort study performed by our group3.The peak incidence in late gestation is highly relevant as the percentage of unexplained stillbirths increases near term. The presence of a fetal inflammatory response strongly correlates with spontaneous labour and its absence with unexplained antepartum death.

O32 - Parallels between SIDS and stillbirths: a role for inflammation?

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Infant mortality due to stillbirths, Sudden Infant Death Syndrome (SIDS) and infection is higher among some ethnic groups (Aboriginal Australians, Native Americans and American Blacks) compared to families of Caucasian origins in the same countries. While these disparities are ascribed primarily to socioeconomic disadvantage, there is emerging evidence that genetic background and interactions between environmental factors influence inflammatory responses suggested to play a role in fatal infections and SIDS.

It is suggested that stillbirths represent one end of a spectrum of sudden unexpected deaths in infancy. SIDS and stillbirths share several risk factors: small for gestational age; infection; maternal smoking; high incidences among ethnic groups at increased risk of infections. Maternal obesity is a risk factor for stillbirths but not for SIDS. Fat cells, like cells of the immune system, produce pro-inflammatory cytokines, e.g., interleukin (IL-6). Inflammatory responses of both mother and infant need to be examined in relation to stillbirths.

Pro-inflammatory responses to infections or bacterial toxins are suggested to precipitate events leading to some SIDS. Among ethnic groups at increased risk of infant deaths, the predominant genotypes of some pro-inflammatory cytokines are those associated with high responses. The predominant genotype for interleukin-10 (IL-10) which damps down pro-inflammatory cytokines is associated with low responses. Smoking is a risk factor for infection, SIDS and stillbirths. White blood cells (WBC) of smokers had lower IL-10 responses to bacterial toxins. IL-10 responses of WBC with the genotype prevalent among high risk ethnic groups was the one most suppressed by smoking.

Our hypothesis is that genetic and environmental risk factors associated with high pro-inflammatory responses to infection contribute to events leading to some currently unexplained stillbirths. We present a model for interactions among genetic and environmental risk factors for stillbirths and propose a prospective study to test this hypothesis.

WORKSHOP: PROTOCOLS AND INVESTIGATIONS

O33 - Work-up of stillbirths

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The generally accepted or recommended evaluation for stillbirth differs among experts due to lack of clear data. Identifying the etiology of stillbirth is important to determine recurrence risk for future pregnancies, especially when medical intervention may prevent recurrent stillbirth. Careful medical and obstetric history and physical examination can identify medical conditions, infections, recurrent placental insufficiency, and other conditions that contribute to stillbirth. The single most useful diagnostic test is fetal autopsy. In addition to the identification of birth defects and morphologic abnormalities suggesting genetic or developmental abnormalities, autopsy can determine and/or confirm numerous other causes of stillbirth such as infection, anemia, hypoxia, and metabolic abnormalities. When autopsy is declined, partial autopsy or postmortem magnetic resonance imaging may provide substantial information. Gross and histologic evaluation of the placenta, membranes, and umbilical cord allows for diagnosis of umbilical cord accident, infection, genetic abnormalities, and anemia. Fetal karyotype is valuable; chromosomal abnormalities are present in 6-12% of stillbirths. The risk of an abnormal karyotype is higher for fetuses with structural abnormalities, dysmorphic features or those dying earlier in gestation. Comparative genomic hybridization shows promise for the identification of chromosomal abnormalities in stillbirths when fetal cells cannot be successfully cultured. Routine testing for single gene disorders, microdeletions, and confined placental mosaicism is still considered experimental. Infectious etiology is suspected by carefully performed autopsy and histologic evaluation of the placenta, membranes, and umbilical cord. The pathologist may then proceed with appropriate cultures and nucleic acid specimens (for bacteria or viruses) taken for organisms suspected based on histology. Screening for syphilis is also advised. It is controversial as to whether routine cultures or serology are useful in the evaluation of stillbirth, although parvovirus serology may be useful. Fetal-maternal hemorrhage should be screened for using Kleihauer-Betke test (KBT) or flow cytometry, detecting fetal erythrocytes in maternal blood. An indirect Coombs' test should be used to exclude red cell alloimmunization as a cause of stillbirth. Routine testing for antiphospholipid syndrome and/or heritable thrombophilias is controversial. Testing cases characterized by placental insufficiency, such as intrauterine growth restriction or placental infarction seems appropriate. However, some heritable thrombophilias are present in a large proportion of normal individuals and a positive test may be unrelated to stillbirth. Thus, caution must be used before adopting widespread testing. Clinically overt diabetes and thyroid disease should be excluded. Routine toxicology screen for illicit drug use is appropriate in most centers.

O34 - Neuropathology of unexpected perinatal loss

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The problem of perinatal loss at post-mortem examination is a Gordian knot to open, not to cut. Only a few studies on stillbirth thus far have examined adequately the nervous system whose abnormalities are notoriously relevant to any discussion of the pathology of the subject. Thus, today's basic information on this aspect is still poor.

To contribute to a more balanced assessment of neuropathological substrate of perinatal loss, the present neuropathologic research will focus upon the multifaced involvement of the central autonomic nervous system. Subtle lesion of the brainstem and cerebellum are likely responsible for disruption on neuronal pathways.

The in-depth isthopathological examination of the central autonomic nervous system in a wide sample of unexpected perinatal death (65 stillbirths and 14 early neonatal deaths) and SIDS victims (140 cases), revealed in all cases congenital anomalies, in particular: hypoplasia of the arcuate nucleus (observed in 57% of stillbirths and 50% of SIDS victims); hypoplasia of the parafacial complex (75% of stillbirths); hypoplasia of the parabrachial/Kölliler Fuse complex (30% of both fetal and early neonatal deaths); immaturity of the cerebellar cortex (10% of fetal loss and 25% of SIDS victims).

In conclusion, neuropathology is an integral component and a consistent substrate of unexpected perinatal loss and SIDS. Among these common stillbirth and SIDS causing factors, the nervous and cardiac ones are the most impressive. These are often associated with one-another, in spite of being different in type and nature, as in the cases with malformations of the heart's AV junctions on the one side, and the brain-stem and cerebellum on the other.

It is hoped that such evidence will prove useful to both the pathologist and the clinician confronted with victims of perinatal catastrophe, in the autopsy room to explain death or on the spot of save life.

O35 - Fetal loss in women with hereditary deficiencies of antithrombin, protein c or protein s, and the contribution of cosegregation of other thrombophilic defects: results from a retrospective family cohort study

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Introduction: Hereditary deficiencies of antithrombin (AT), protein C (PC) and protein S (PS) are strong risk factors for venous thromboembolism (VTE). The risk is reinforced by cosegregation of other thrombophilic defects. Single deficiencies and cosegregation may similarly increase the risk of fetal loss due to placental thrombosis.

Methods: In a retrospective family cohort study, we assessed the absolute risk of fetal loss, comparing deficient women (probands and relatives) to non-deficient relatives. Of 89 female probands and 541 female relatives, 319 were evaluable, who had 987 pregnancies (580 in 185 deficient women).

Results: Absolute risks in AT and PC deficient women versus their non-deficient relatives were 46.0% versus 29.4% (adjusted relative risk 2.0; 95% CI, 0.9-4.6) for total fetal loss, 30.0% versus 27.5% (1.1, 0.5-2.7) for early fetal loss and 22.0% versus 2.0% (15.4, 1.9-124.6) for late fetal loss. PS deficiency type I and III were not associated with an increased risk of fetal loss. Adjusted relative risks in PS deficient women were 1.0 (95% CI, 0.5-1.9), 1.0 (0.5-2.0) and 1.2 (0.3-4.2), respectively. Cosegregation of factor V Leiden or prothrombin G20210A in 20.0% of AT or PC deficient women and 18.9% of controls, did not influence the risk of fetal loss. This may be explained by exclusion of pregnancies after prior VTE, because thromboprophylaxis might have influenced outcome. Consequently, women at highest risk (i.e. more cosegregation) were excluded.

Conclusion: AT and PC deficient women are at high risk of fetal loss, in contrast with PS deficient women. An additional effect of cosegregation, though plausible, was not demonstrated.

ROUNDTABLE ON PREVENTION

O36 - Researching Risk

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The relative and absolute risks of perinatal death estimated from observational studies are frequently employed in counselling about obstetric intervention. The statistical basis for these estimates is, therefore, crucial but many studies are seriously flawed. A number of important issues around quantitative estimates of stillbirth risk will be discussed, including (1) definition of the cause of the death, (2) differentiation between antepartum and intrapartum events, (3) use of the appropriate denominator for the given cause of death, (4) assessment of the cumulative risk where appropriate, (5) use of appropriate statistical tests, (6) stratification of analysis of delivery-related deaths by gestational age, (7) specific aspects of risk comparison in multiple pregnancies.

O37 - Stillbirths and decreased fetal movements: prevention by improved information and management

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Maternal fetal movement counting (FMC) is ongoing everywhere, performed and interpreted by every pregnant woman. Formal FMC is only an attempt to improve the value of the existing "auto-screening". There is no evidence for optimal "alarm limits" in formal FMC, nor that formal FMC is superior to less intrusive ways to improve information and awareness. Pregnancies with decreased fetal movements (DFM) are indeed at-risk and prevalent, but we lack evidence on the optimal management. Yet, there is sufficient evidence and knowledge to indicate better information and management - eliminating both imminent fetal jeopardy and risk of fetal growth restriction.

We introduced new guidelines for the management of DFM (including both CTG and ultrasound scanning) in a total population in Norway. We also implemented an information campaign to promote maternal awareness towards fetal movements, including a visual FMC chart as a guiding tool. We included 19, 407 pregnancies (1215 with DFM) in a seven-month control period, followed by 46, 132 pregnancies (3014 with DFM) in a 17 month intervention period. All cases were collected for quality improvement purposes without maternal consent. There was no increase in the incidence of DFM. Among cases with DFM a significant change in maternal behavior was observed, and fewer would wait > 24 h with absence of fetal movements. Health professionals increased the use of ultrasound. A larger proportion were returned to standard antenatal care without further follow-up, and there were fewer admissions and preterm births. While the prevalence of fetal growth restriction did not change, fewer infants were born with a low Apgar score, and there was no increase in infants transferred to neonatal care. Mortality was reduced by half, including for normally formed stillbirths. In our total population, mortality among third trimester singleton pregnancies was reduced by one third to 2.0/1000.

O38 - Prevention of SGA- the old and the new

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Currently there are no reliable screening tests for SGA pregnancies and identification of at risk groups is imprecise. A range of therapies, nutritional and dietary supplements have been prescribed in an attempt to reduce SGA .Most therapies have been found to be ineffective and some studies have suffered from methodological problems. A limited number of treatments have been shown to have a beneficial effect and to reduce the risk of SGA. The Cochrane systematic review of low dose aspirin trials reported an overall 8% reduction in SGA(RR 0.92(0.84-1.01) with greater benefit in women treated with >75mg. More recent data suggests that low dose aspirin reduces the risk of recurrent SGA in women with a previous SGA baby [RR 0.74 (0.56-0.98)].Recent data from several sources has reported that low dose multivitamins also reduce the risk of SGA. A randomised study from Tanzania showed that multivitamin supplementation reduced the rate of SGA[RR 0.77(0.68-0.87).Non randomised studies in both low risk and high risk pregnant women have also reported reductions in SGA with low dose multivitamin treatment[RR0.64(0.40-1.03) and RR 0.42(0.26-0.67) respectively.

Smoking is an important modifiable risk factor for SGA and smoking cessation programmes have been shown to not only reduce smoking but also to reduce the rate of low birth weight babies (OR 0.80 (0.67 - 0.95). Strategies to assist pregnant women to become smoke free should be a routine component of antenatal care.

In the future prevention of SGA will depend on reliable prediction of women at high risk of SGA, and improved understanding of the pathophysiology, so that trials of targeted therapies can be undertaken in appropriate women.

WORKSHOP: CLASSIFICATION I

O39 - A modified obstetric classification system of stillbirths for a national confidential enquiry

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Introduction: Nationally, stillbirth rates have remained static since the mid-1990s. Since its inception, the Confidential Enquiry into Maternal and Child Health (CEMACH) and its predecessor CESDI has classified stillbirths using the 'Aberdeen' Obstetric Classification system published in its present form in 1986. A disadvantage of the system is that it describes 50% of stillbirths as 'unexplained'. The system is used in the CEMACH perinatal report produced for England, Wales and Northern Ireland and this lack of precision inhibits the usefulness of data to clinicians and those responsible for planning services It was deemed necessary to use or develop a classification system that would be clinically more useful. The system had to be relevant to CEMACH output and compatible with its available resources

Method: In recent years, a number of newer classification systems have been published most of which classify a smaller proportion of deaths as unexplained so these were reviewed. Each was assessed for complexity; the mechanism by which classification was achieved; the results of the classification; new subcategories; flexibility; and the degree to which it would allow continuity with previously held CEMACH data.

Results and conclusions: None of the newer classifications allowed easy mapping of past CEMACH data and many required resource unavailable to CEMACH. The review suggested a more useful CEMACH output could result partly from a modification of its currently used system and partly from a modification of the classification process. Changes to the process include: use of ICD-10 codes; recording more than one factor involved in the death (i.e. primary and secondary codes); routine calculation of growth centiles. Changes to the classification system include: simplification of categories (detail can be obtained by codes); inclusion of growth restriction as major category; identification of significant associated obstetric factors. A pilot of the approach is planned.

O40 - Classification of stillbirths and neonatal deaths in Australia: using the PSANZ system

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Introduction: Since 1986, clinicians in Australian States and Territory Perinatal Committees, have been considering ways of classifying fetal and neonatal deaths beyond standard ICD (International Classification of Diseases) coding, with a view to better assessing aetiology and to more accurately determine specific factors leading to perinatal death. In 1996, the first meeting of a working party to develop a uniform system for use in Australia and New Zealand was convened. Consensus was reached in 2000 and the dual classifications systems complete with instructions for use and training cases were published[1] and made available of the PSANZ-PMG website. The PSANZ Perinatal Death Classification (PSANZ-PDC) is designed to identify single most important antecedent factors resulting in the death for stillbirths and for neonatal deaths. In addition, for neonatal deaths only, the PSANZ Neonatal Death Classification (PSANZ-NDC) identifies the single most important factor in the neonatal period which caused the death. The PSANZ classification system is now in use across Australia and New Zealand.

"Causes" of perinatal death using the PSANZ classification system:

Perinatal deaths using the PSANZ-PDC: According to the PSANZ-PDC, the main categories of perinatal deaths, accounting for almost 50% of the deaths in Australia in 2004 were: Unexplained antepartum death (21%); Congenital abnormality (11%), and Spontaneuos preterm (17%).

Stillbirths using the PSANZ-PDC: Data from three States (Queensland, Victoria, and Western Australia) collaborating in a large multicentre study enables detailed analysis of the classifications of stillbirths. In this cohort, of 499 389 births spanning the years 2000-2003, the four leading categories of fetal death for births in a multiple pregnancy were: Specific perinatal conditions (mainly twin-twin transfusion) (35%); Spontaneous preterm (24%); Unexplained antepartum death (15%); and Congenital abnormality (11%). The main categories for singletons were: Unexplained antepartum death (28.2%); Congenital abnormality (20%); Maternal conditions (13%); Spontaneous preterm (10%).

Neonatal deaths using the PSANZ-NDC: Using data from one State (Queensland, 49,000 births). The main categories for neonatal deaths (n=199) according to the PSANZ-Neonatal Death Classification were: Extreme prematurity (32%); Congenital abnormality (26%); and Cardio-respiratory disorders (12%).

Summary: The PSANZ dual classifications system has been well accepted across Australia and New Zealand; this provides an opportunity to undertake meaningful analyses and comparisons across populations as to the factors contributing to perinatal deaths and therefore to more effectively address areas of need to further reduce perinatal mortality.

O41 - The TULIP classification of perinatal mortality: Past, present and future?

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After the analysis of over 100 cases of perinatal mortality, the TULIP classification system was developed by a multidisciplinary group mainly because difficulties arose using existing systems. Focus was on our National Cohort of Stillbirths-study and the emphasis was on the pathological entities initiating the chain of events that has led to death. Particular attention was on placental causes of perinatal mortality. We aimed for a hierarchical system in which we failed. Due to the similarities with the cognitive process of diagnosis making, a pattern recognizing based system seemed preferable for in-dept analysis of a case. Education, training and multidisciplinary panel meetings for difficult cases are needed, which makes the system more difficult to use. At present, using TULIP, we gained more insight into the distribution of causes for stillbirth. It becomes clear that specific placental pathological entities like hypoplasia or immaturity warrants more research into their etiology. TULIP provides the backbone to which our National Cohort of Stillbirths can be analysed. In addition, TULIP has been given the background on which a National Perinatal Audit-study has been performed and this is currently being expanded to local hospitals. Risk factors as well as contributing factors and substandard care factors can be registered. Classification in TULIP, according to judgements on avoidability gives more insight into areas of improvement for better perinatal care. As so often, using TULIP from its original definitions, several shortcomings became clear during longer use. Neonatal causes of perinatal death are underscored. Debates and new insights into placental bed pathology and the definitions of other pathological entities warrants changes. The system is complicated and needs a certain predisposition. However, we feel TULIP is flexible and may be improved. In respect to the current debate about the need for an universal classification system TULIP may provide the in-dept analysis which is sometimes needed and in that respect could act as a third step in the analysis of a death, being the "Why", in addition to the first two steps of the analysis: "What" and "When".

O42 - A re-evaluation of the CODAC classification system

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Background: The many classification systems for stillbirths have had different origins and purposes, which has been reflected in a predominant focus on clinical obstetrics, perinatal pathology or population-based epidemiology. None have specifically been developed for developing countries. Two crucial features of a good classification system is that it must retain the actual information about a stillbirth that is perceived as important by those who use the classification, and there must be a certain level of user friendliness. In 2006, we (JFF & HP) proposed the first version of a new multilevel and flexible classification system to enable the integration of the different purposes of stillbirth classifications into one classification - CODAC. The CODAC system has now been tested in a "real life" setting by seven independent teams, not including the original developers of the classification system.

Aims: Evaluate the CODAC classification system in terms of usefulness and ease of use, to identify the most important areas of improvement of the system for the planned Version II.

Methods: Seven study teams, across six countries (2 developing country settings), applied the CODAC system to cohorts of stillbirths from their regions in a "real life" testing situation. A total of 618 stillbirths were classified. Two ratings were applied for each case using Likert scales (0 to 4). The scales measured: ease of use *(Ease)* and how well important information about the death was retained (InfoKeep). Data analysis was undertaken by an independent data analyst.

Results: The most frequently reported main causes of death in CODAC were "Unknown" 29.5%, "Placenta" 29.1% ("Circulatory disorder (non-abruption)" 8.6%, "Abruption" 8.9%) and "Maternal" 11.0%. When exploring the "Unknown" category, 20.8% of stillbirths were reported as "Unexplained", and within this category 9.7% were "Unexplained despite adequate examination according to guidelines". In 9.0% of cases the teams did not find a suitable specified category at the final (third) level, and used the alternative "Other". Among the most common causes of death, "Other" was used in 3.3% (in "Unknown"), 6.7% (in "Placenta") and 2.9% (in "Maternal"). Despite 54 sub-categories in the "Malformation" category, the two categories with the most frequent use of "Other" were "Malformation" 23.5% and "Fetal" 33.3%. With some areas in which the specified category seemed difficult to identify, the user friendliness of CODAC was mediocre or worse (*Ease* < 2) in 5.0% of cases. Overall the ability of CODAC to retain significant information

was mediocre or worse (*InfoKeep* < 2) in 4.2% of cases, but no category has a high percentage of these. One category, "Intrapartum", had a lower overall percentage of excellent scores (3 or 4) in both *InfoKeep* (70.6%) and *Ease* (76.5%) than most other categories. This was, however, mainly caused by the emphasis on developing country settings in this category, and cases of intrapartum deaths from developing countries were scored with high *InfoKeep* (97.4%) and consistently (100%) with high *Ease*.

Conclusions: Based on the results of this re-evaluation, the main structure and systematic approach of the CODAC classification system seems to provide opportunities for a high retainment of significant information and adequate easiness of use, even in developing country settings. Yet, several significant areas of improvement have been identified, and we are suggesting several improvements in the CODAC classification system Version II.

O43 - ReCoDe: Classification of stillbirth by Relevant Condition at Death

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ReCoDe is a system for classifying stillbirth which, from the outset, does not seek to establish a 'cause'. Instead, it defines primary and secondary conditions associated with the death. This avoids the uncertainties of assigning causation and allows inclusion of a category such as fetal growth restriction (FGR) even though it is not in itself a 'cause'. FGR is defined by antenatal diagnosis and/or postmortem and/or a customised birthweight percentile <10.

The method is hierarchical, broadly using anatomical categories starting with the fetus and moving stepwise outwards up to the mother, then intrapartum events and finally external injury. The hierarchy is designed to encourage consistency in coding by a single operator, rather than requiring deliberation by committee. Mapping to ICD10 codes further simplifies the assignment of categories, and this process can then be automated by computer.

An inter-observer study was undertaken and included four observers (obstetrician, midwife, pathologist and coder) plus computerised software mapped to ICD10. Sixty-two consecutive perinatal death notifications received from January 2005 were analysed by each observer. For all categories the overall proportion of agreement was 0.87 (95% CI 0.80-0.93); kappa statistic 0.82 (95% CI 0.74-0.9). The proportion of agreement between the panel and the computerized coding was 0.97 (95% CI 0.92-1); kappa statistic 0.96 (0.89-1). This suggested good overall agreement between observers with different backgrounds, and the potential to further simplify the coding through computerisation.

Application of this classification system to a 10 year West Midlands database (1997-2006) including 3802 stillbirths showed that the largest category was deaths associated with fetal growth restriction (41.2%). Only 618 (16.3%) remained 'unexplained'.

The new classification highlights issues which are of direct relevance to public health and health policy. The preponderance of babies which were FGR at the time of death informs clinicians as well as policy makers of the priorities for prevention. The majority of such deaths occur at gestations where babies are mature enough to do well if delivered in time and in good condition. The focus needs to shift to better identification of those babies which are at risk.

WORKSHOP: CLASSIFICATION II

O44 - An evaluation of classification systems for stillbirth

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Background: Classification systems for stillbirths are used for audit, parent counselling, research and epidemiological surveillance. These different purposes may necessarily lead to different approaches to classification and interpretation of the causes of stillbirth. We aimed to evaluate the contemporary classification systems in terms of usefulness; ease of use; and inter-observer agreement.

Methods: Seven study teams, across six countries (2 developing country settings), applied the contemporary classification systems to cohorts of stillbirths from their regions in a "real life" testing situation. Two ratings were applied for each case according to each of the classifications using Likert scales (0 to 4): Ease of use (Ease), and the degree in which important information about the death was retained (InfoKeep). InfoKeep and Ease scores were compared using one-way ANOVA. A subset of stillbirths were classified by all study teams to assess inter-observer agreement.

Results: Six classification systems were evaluated (Amended Aberdeen, Extended Wigglesworth, PSANZ-PDC, ReCode, Tulip and CODAC). Data received from six study groups to date with a total of 580 stillbirths showed the most frequently reported InfoKeep categories were: Placental pathology (70%); Maternal history (61%); Fetal history (46%); Autopsy (40 %) and Cord and membranes (27%). While InfoKeep scores for these categories were consistently higher than scores for other categories, CODAC performed best with scores of 3.1-3.4 for these categories while Wigglesworth and Aberdeen scored lowest (<2 consistently). CODAC received the highest overall InfoKeep score (mean 3.3), with PSANZ-PDC and ReCode with scoring 2.7 and 2.4 respectively. Ease scores were similar across the classifications with CODAC, PSANZ-PDC and ReCode scoring the highest (scores of 3.4, 3.2 and 2.8 respectively). Preliminary evaluation of inter-observer agreement for the major classification categories (57 cases across four scorers) showed Tulip to have the best agreement (Kappa 0.69 - moderate to strong agreement). CODAC, PSANZ_PDC and ReCode showed moderate agreement (Kappas 0.61, 0.55. 0.52 respectively) and Aberdeen and Wigglesworth fair agreement (0.41 and 0.32).

Conclusions: There appears to be room for improvement in classification systems for stillbirth in terms of retaining relevant information about the death. Final results including subgroup analyses to identify specific areas for further enhancement to classification systems will be presented.

O45 - Avoiding *avoidable* stillbirths? Lessons from a critical review

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We conducted a continuous audit of stillbirths since 2004. Based on the CESDI classification we developed a classification of avoidable and non-avoidable cases.

A multi-disciplinary & multi-agency team reviewed all cases and robustly questioned practice and practice standards. Avoidable cases are identified and criticism fed back to colleagues. Common threads were identified and remedial protocols and processes instituted.

Since inception there were 104 stillbirths. 76 classified as unavoidable; 9 as avoidable (due to patient or family factors) and 19 (due to staff or protocol failures). Details of the types of factors will be presented.

Patient and family factors often arose through delays accessing help, often among ethnic minorities. To improve access we arranged multi-lingual link-workers available 24/24 by mobile phone.

We retrospectively audited the birthweights of stillborn babies against the predicted birthweight from the Centile Calculator (http://www.gestation.net). This demonstrated a preponderance (75%) of birthweights below the 20th centile. This led to the use of GROW software to prepare customised growth charts in one of our high-risk midwifery practices.

The critical review approach was used successfully and we believe it represents a model to use in other units and in other clinical settings with adverse outcomes (e.g., unexpected ITU admissions, unexpected deaths, etc).

The project was stimulated by recognition of a worryingly high stillbirth rate in our unit. During the course of the project our stillbirth rate has fallen from 9.5 per 1, 000 to 6.5 per 1, 000. We have gone from being a statistical outlier to being better than average.

O46 - Classifying perinatal deaths in South Africa

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In South Africa perinatal deaths are classified using a number of methods. These are recorded in the Perinatal Problem Identification Programme (PPIP).

All babies born 500g and above are recorded, and perinatal mortality rates (PNMR) are given as either for 500g and above or 1000g and above. Mortality rates are available for 500g weight categories 500g-999g, 1000g-1499g, 1500g-1999g, 2000g-2499g and 2500g and above. The low birth weight rate (LBWR) is also recorded, as is the perinatal mortality for low birth weight babies.

Any baby born dead 500g or more is regarded as a stillborn and neonatal deaths are recorded until discharge from hospital. All perinatal deaths are classified as; born alive; alive on admission but stillborn; fresh stillbirth but dead on admission; macerated; and stillborn, admission status unknown. Neonatal deaths are classified as early or late. Due to inadequacies in the health information system neonates that are discharged and die within 28 days either at home or during a readmission to the paediatric wards are not recorded. The neonatal mortally rate is very much a reflection of early neonatal deaths.

The causes of deaths are divided into primary obstetric causes and final neonatal causes. All perinatal deaths have a primary obstetric cause and this is defined as 'the factor that probably initiated the train of events leading to death'. It is derived from the Aberdeen Classification developed by Sir Dugal Beard and modified by Whitfield et al in 1986. All neonatal deaths are given a primary obstetric cause of death and a final neonatal cause of death. The neonatal cause of death is derived from the classification of Wigglesworth.

A Perinatal Care Index (PCI) has been developed to compare the standard of care of various areas. It takes into account the environmental factors so that the comparison can be more valid. The LBWR of an area is an indication of the socio-economic status of that area. It is not dependent on the care received in the clinic or hospital, but more dependent on environmental factors. Most deaths occur in babies weighing less than 2500g. If the LBWR is high, it is to be expected that the PNMR will be high. If the PNMR is low in this set of circumstances, then good care is present. However, in areas with a low LBWR that have a high PNMR, then the care must be poor. A low PCI indicates good care whereas a high PCI indicates poor care. It is only appropriate to use this index to compare hospitals with similar circumstances or in the same hospital over a period of time.

O47 - Modified Wigglesworth classification of stillbirths and neonatal deaths - Malaysia's experience

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Introduction: Perinatal and neonatal mortality rates are important indicators of the health status of a population. Reduction in stillbirths and neonatal deaths are primary objectives of obstetrics and newborn care in Malaysia. The decline in perinatal mortality augurs well for the extensive network of health infrastructure, manpower and comprehensive family health programmes.

Method: The Rapid Reporting Format on Stillbirths and Neonatal Deaths using the modified Wigglesworth classification was established in 1998 to obtain accurate data on stillbirth and neonatal mortality. It captures stillbirths and neonatal deaths of birth weight equal to or more than 500 g (or 22 completed weeks if birth weight is not known) to 27 completed days of age.

Results: Data analysed, showed that stillbirth rate declined from 7.7 per 1, 000 total births in 1998 to 5.3 in 2002. NMR reduced from 5.5 per 1, 000 livebirths to 4.0 and PMR declined from 11.9 per 1, 000 total births to 8.4 during the same period of time (Fig 1). Stillbirths have contributed to a higher proportion of PMR and Normally Formed Macerated Stillbirths are the major cause followed by Birth Asphyxia and Lethal Congenital Malformations (LCM). The leading cause of neonatal deaths was Immaturity, LCM and Asphyxia (Fig. 2).

Discussion: With better understanding of the classification system, excessive numbers of deaths classified as 'unknown' and 'other' has decreased over the years. Improvement in obstetric and neonatal services including effective intrapartum monitoring, neonatal resuscitation, neonatal intensive care facilities, prenatal counselling of at risk mothers and Folic acid fortification can reduce morbidity and mortality.

Conclusion: Malaysia still faces challenges to further reduce stillbirths and neonatal mortality and it gets more difficult as the rates become lower as it involves manpower, financial resources and innovative strategies. Future challenges, require a review of the current classification system, incorporate autopsy or placental pathology and develop an auditing system for stillbirth and neonatal deaths.

P1 - Strengthening care and management strategies in pre-eclampsia -eclampsia to prevent stillbirths

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Pre existing maternal disorders such as pre eclampsia, abruption placenta and illnesses like diabetes, syphilis, to name but a few have been observed for centuries as some causes of stillbirth world wide. Obstetric disorders that commonly impose higher risks on the mother and fetus include pre-eclampsia - eclampsia, abruption - placenta, prematurely, and small size gestational infant. There are other contributory factors which lead to delay in seeking proper antenatal care. These include socio economic status, illiteracy among women and cultural practices. Among the above mentioned causes, pre-eclampsia has been seen as the leading cause of stillbirths.

While pre eclampsia can be prevented, literature reveals that these women become identified at a later stage in pregnancy when it is no longer easy to control. This could be related to late registration for antenatal care and failure to adhere to stipulated ante- natal care schedule. Early ante- natal care and regular visits need to be encouraged to permit better assessment and identification of risk factors and their adequate management. Lack of adequate health education might be a contributory factor since the Family Welfare Educator, who is not a midwife, gives most of the health education to ante- natal clients and therefore emphasis on early registration and adherence to regular ante -natal care schedule may not be adequately addressed... On the other hand, it is important that vital signs and urine testing are assessed by a midwife during ante - natal care visits instead of a family welfare educator who has no idea about the importance of proper reading and recording of vital signs of an ante - natal care client.

It is also important that during ante - natal care, the client is informed of the importance of institutional delivery and to make sure that she is avails herself for admission as soon as labour commences. For those who are far from delivering institutions it is advisable to encourage them to seek accommodation closer to the facility to avoid delay as it is common in Botswana that transport is not easily available during emergency especially in the rural areas. Clients should be continuously given feedback pertaining to their ante - natal situation as well as that of the unborn baby. This will assist them in understanding the advice given to them by the midwife. During labour and delivery, skilled midwives should conduct the monitoring of labour and delivery. In addition, the health care system should provide safe and appropriate drugs required for the control of elevated blood pressure and those administered during labour in case of eclampsia

This therefore calls for an increase in the number of midwives in the country so as to be able to conduct most activities they are trained for. This presentation attempts to put forward vital strategies that can be applied during pregnancy for the purpose of saving the lives of both the mother and the baby.

P2 - Challenges and strategies towards the prevention of stillbirth in Botswana

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The prevention of stillbirth and perinatal loss is a concern to most countries world wide. Some countries have designed programmes which focus solely on this problem, while others have integrated the services into the health care programmes. Botswana is one of those countries which have integrated the services to prevent stillbirth and perinatal loss into the Sexual and Reproductive Health programme. In spite of the integration of services, challenges still exist such that statistics indicate that there has not been any change in the reduction of stillbirth in the past three years.

Challenges: Several challenges facing the health care system presently are related to mother, foetus and others. Early registration and regular visits for expectant mothers at the antenatal clinic for assessment and care still possess a big challenge. This therefore leads to irregular monitoring of the mother's health and the unborn babies' growth and development. Records indicate that in 2003, on average, expectant women visited antenatal clinic five times during their pregnancy, looking at the ratio of new to repeat visits, Health Statistics Report (2003). This is just a result of other challenges such as distance from home to the clinic, lack of funds for transport even transport itself in remote areas. Babies are still born before arrival to the health facility, and this leads to foetal mortality resulting from situations such as cord around the neck and unsupervised delivery for a baby who is small for dates or premature even twin delivery. Other challenges can be associated with poor understanding of the importance of antenatal care and institutional delivery.

Strategies: Health Education given collectively and to individual clients need to be strengthened through health talks by qualified Midwives, who attend refresher courses to keep abreast with the current knowledge, skill and technology in midwifery. It is also through health education that some religious and cultural believes and practices about pregnancy may be changed. Constant review of Midwifery curricular should be done to produce Midwives with up to date skills to deal with complicated pregnancies and deliveries. More Midwives need to be trained to mend the remote clinics thus shortening the distance from home to the clinic with midwifery services and also to the delivering health facility. Social welfare services need to be involved in assisting those who are faced with poverty and can not even afford to pay for transport to the nearest health facility for antenatal care and delivery.

Conclusion: The problem of stillbirth and perinatal loss can be managed through collective effort, that is, the mother understanding all facts about pregnancy and delivery given by well informed and qualified Midwives who are within reach at all times, especially for emergency. The availability of resources to everyone concerned, such as funds, transport for clients and Midwives' use, can contribute to the reduction of still births to a significant extent. The involvement, support and flexibility of Governments can not be over emphasized, especially in financing education and training of personnel, funding of programmes and monitoring and evaluating the Maternal and Child Care activities, closely observing the statistics for change.

P3 - Taming perinatal mortality by catering the rural population through satellite maternity centers

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(See Abstract O8)

P4 - Stillbirths in India- the concerns and the recommended strategies to reduce the stillbirth rate

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India is a country with vast diversity. This applies even to the health care facilities, their use and the impact. The perinatal death rate and stillbirth rate in India are 70 per 1000 live births and 39 per 1000 live births (WHO 2006), with the hospital and urban based data showing lower rates.

The concerns: Low rate of women literacy, careless attitude towards the obstetric care, lack of available care or inability to avail care due to poverty, poor transportation facilities are the problems to be addressed. Priority should be on changing the attitude of the care givers as well as the women and their families.

It is difficult to address to these problems solely at the level of Government sector. Involving the private sector facilities will help in improving the community participation in the Government led activities.

The suggested strategies to reduce the stillbirth rate in India are:

1. Active involvement of the private sector health institutions in community level Obstetric care

The Government should recognize and encourage the hospitals rendering community level services. Every major private sector hospital should be encouraged to identify specified areas in their community for community services including Obstetric services The tertiary level hospitals should monitor and support the Obstetric care given at the peripheral centers; well connected referral services should be made available.

2. Interaction between the individual practitioners and the clinicians at tertiary hospitals

The clinicians at the tertiary care hospitals should support the individually practicing Obstetricians; there should be effective interaction between the two in the form of referrals and feedbacks with respect to case management.

3. Health education at community level using basic service providers

The midwives and the birth attendants as well as the private practitioners should be periodically updated on the Obstetric care and also should be involved in audits. It is important to discuss how a stillbirth or perinatal death could have been averted. The Anganawadi workers may be trained to educate the women attending the Anganwadis regarding Obstetric care, contraception and small family norm. Women attending the antenatal care should be periodically educated regarding the warning symptoms in pregnancy and how to get immediate and optimal care at that moment.

4. Conducting meaningful perinatal audits

Perinatal audits must be made more meaningful than merely be statistics based presentations. The birth attendants, midwives, nursing staff, residents as well as interns must be encouraged to actively participate in the audits. This will help in inculcating the practice of audit based improvement in the care given. The medical and nursing education curriculum should have one compulsory audit based exercise and the trainees should be asked to propose their suggestions for improving the care.

P5 - Investigating factors associated to nurses' attitudes towards perinatal bereavement care: a study in Shandong and Hong Kong

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Introduction: Caring for and supporting parents whose infant has died is extremely demanding, difficult and stressful. It is likely that the attitude of nursing staff can influence recovery from a pregnancy loss and nurses with positive attitude to bereavement care can help bereaved parents to cope during their grieving period. The purpose of this study is to compare Shandong and Hong Kong nurses' attitudes towards perinatal bereavement care and to identify factors associate with such attitudes.

Methods: Data were collected through a structured questionnaire from the Obstetrics and Gynaecology unit in five hospitals in Hong Kong and Shandong during May to August 2006. Outcome measures including attitudes towards perinatal bereavement care, importance on hospital policy, and training support for bereavement care.

Results: Majority of nurses in this study held a positive attitude towards bereavement care. Results showed that only 39.3% (n=130) of nurses had bereavement related training. By contrast, about 89.8% of nurses (n=300) showed they need to be equipped with relevant knowledge, skills and understanding in the care and support of bereaved parents, and more than 88.0% (n=296) would share experiences with colleagues and seek support when feeling under stress. Regression model showed that age (p=0.001), past experience in handling grieving parents (p=0.013), and nurses' perceived attitudes on hospital policy (p=0.003) and training provided (p<0.001) for bereavement cares were factors associate with nurses' attitudes towards perinatal bereavement care.

Discussion/conclusion: Hong Kong and Shandong nurses emphasised their need for increased knowledge and experience, improved communication skills, and greater support from team members and the hospital for perinatal bereavement care.

P6 - The challenges and recommendations to reduce infant mortality rate in China

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The infant mortality rate (IMR) in China has gradually improved since the early 1950s. In 1951 the IMR was around 300 infants per 1000 live births, but by 2001 it had declined to 33 infants per 1000 live births. This translates into a decline of almost 89 per cent in just 50 years. However, when China's IMR is compare with countries in East Asia, it is still higher. In the West, significant evidence has been developed of successful strategies / interventions to reduce IMR. Some key issues in improved maternal and newborn health were such as 1) providing emergency obstetric care; 2) delivery by a skilled birth attendant; 3) implementing an emergency referral; 4) improving access to contraception; 5) access to safe abortion/care for post-abortion complications; 6) focused antenatal care; and 7) providing postpartum care. However, currently the health care system in China is not supplying the basic training and logistic support to address the above challenges. For example, the skilled birth attendants cannot work in isolation, and need supervisory support and in-service training to maintain skills. On the other hand, some researchers suggested that economic instability, income inequality and poverty are positively correlated with IMR but negatively correlated with unemployment rate. Furthermore educational levels of the female population prove to be important determinants of IMR. This could be due to the increased education which leads to marriage being postponed and higher maternal ages, women, especially those who become pregnant at a relatively high age, should receive education on issues such as the importance of obtaining adequate prenatal care and should be encouraged to make full use of the maternal health care during pregnancy in order to reduce the risk of and adverse outcome of pregnancy such as delivering a low-birth-weight baby or encountering other complications. These findings have led to important implications, that is, aside from implementing a successful intervention such as provided skilled birth attendants, the policy-makers in China should implementing economic reconstruction programs such as those that provide more job opportunities that economic hardship can be expected to impact those less able to protect themselves, such as infants in this case, and mat result in a deterioration in their health status. More importantly, enhanced basic needs and better infant health care that is more available and accessible should be directed toward this vulnerable segment of China in this century.

P7 - Comparison of maternal fetal attachment between primigravidas and pregnant women with history of fetal or neonatal death, mashed, 2006

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The previous fetal or neonatal death may have a negative effect on the adaptation of a woman for her new pregnancy. It can also have influence on the development of emotional distress in the attachment between mother and her fetus.

Aim: To assess and comprise maternal fetal attachment (MFA) of primgravidas and pregnant women with history of previous fetal or neonatal death.

Methods: This is a comparative study. Sequential sampling method was used. We collected 120 Iranian healthy pregnant women during their third trimester from 10 health centers in Mashed in year 2006. (80 nuliparous, 40 with history of fetal or newborn death with no lived child). All samples had knowledge of reading and writing. The tools of this study had two main parts: personal demographic and pregnancy information form, and maternal fetal attachment scale (MFAS: Cranley, 1981). Descriptive statistics, X2, Fisher exact, T Test were used by SPSS.

Results: The highest percentage of both age groups belonged to 20-24. Per t test was used for age and pregnancy, and by X2, Fisher exact test for education level, living condition, finance, job unity of two group was proved. A significant difference was found in the 5 subscales of the MFAS between the primigravidas and pregnant women with history of fetal or neonatal death ($P \leq 0.001$). The average of maternal fetal attachment in the primigravidas women was more than second group. The independent t-test also showed a significant difference between two groups (p=0/000).

Conclusion: Due to decrease of maternal fetal attachment in the pregnant women with previous fetal or neonatal death we advise that medical staffs and midwives offer various supportive, educational, guidance, and counseling program for the mentioned high risk group and their couples. We suggest continue the same research during the first and second trimester of pregnancy and postpartum period in the clients whom will be visited in the other clinics.

P8 - IUFD, neonatal death, mother's age and gravidity, a correlation study

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Introduction: The field of perinatology emerged in response to research on the treatment of the mother and fetus before and during child birth, and infants particularly at risk during the neonatal period should be identified as early as possible in order to decrease Neonatal morbidity and mortality.

Aim: Identifying the correlation between: 1) the mother's age and type of Death (IUFD and Neonatal Death). 2) The gravidity and IUFD and Neonatal Death, calling in one of the hospitals of Iran University of Medical Sciences in 1997.

Methodology: This research is a correlation study. In this research 10441 case notes of one year were studied using Poisson statistical selection. After completion of checklist the results were displayed in 12 tables. The descriptive and inferential statistics (X2, Tchouproff coefficient) were used.

Results: The results show that total percentage of Death (IUFD and Neonatal Death) was 2.29%. The highest rate of that was seen under 37 weeks (77.40%), and 39.75% of Death was in gravid 1 and 33.05% of Death was in 20-24 age group. There were correlation between mother's age and fetal life or Death ($P<0.001$) and between gravidity and fetal life or Death ($P<0.001$) and there was correlation between mother's age and IUFD or Neonatal Death ($P<0.05$). (Other remarkable points will be shown during the presentation of the study).

Conclusion: Although the IUFD and N.D were higher in the age 20-24 than the other groups but this could be perhaps because most deliveries occurred in that age group. It seems mothers fewer than 37 weeks need more health care, education and counseling. It is better if a research is done to examine the correlation between the other characteristics and IUFD or Neonatal Death with the goal of reducing these complications, which is the ultimate goal of mother and child health care.

P9 - Stillbirth and neonatal death in Iran: challenges and strategies

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In Iran over the past decades the rate of stillbirth has been substantially reduced. Referring to the last report of Ministry of Health (2006, data was gathered from the postpartum University Public Clinics of 40 big cities and provinces, in Rural area approximately 3.7% ± 0.2 % and in urban area 3.2% ±0.2% of women had previous history of Still birth. Referring to the last reported of Ministry of Health in Iran (Data was gathered from several Public Hospitals of 41 Universities of Medical Sciences in Year 2006), rate of still birth was between 0.00%- 5.23% (Male: 0.00%- 4.82%, Female: 0.00- 5.70%). The highest percent belongs to main referral hospitals in Capital. There were No Still Birth reports in the hospitals of Iran, Eelam, Jahrom, Khouzestan, Sistan & Balouchestan, Zaboul, Golestan, and Mzandaran University of Medical Sciences.

Referring to WHO Health System report (2006), which figured computed by WHO region (Eastern Mediterranean Region "EMR), In Iran Infant Mortality Rate (Per 1000 Live Births) In Both Sexes in Year 2004 were 32, Neonatal Mortality Rate (Per 1000 Live Births) in year 2000 were 22, and Maternal Mortality Ratio (Per 100 000 Live Births) in Year 2000 were 76. Probability of dying Per 1000 Live Birth before 28 days in Iran is significant lower than other s in EMR. (Table)

In Iran, the reasons for stillbirth are; severely knotted and twisted umbilical cord, prolapsed, Placenta problems, severe illness such as diabetes, hypertension, Rh disease, Genitical problem especially in close family marriage, trauma Reductions have occurred because of reductions in risk factors, by improving the prenatal care, guiding and counseling, also prevention of Rh disease, better control of diabetes, better antepartum monitoring of those with risk factors followed by early delivery for those fetuses found to be at risk such as maternal pre-eclampsia, better intrapartum fetal monitoring, increases in Cesarean section for those at risk, on time patient counseling in future pregnancies, availability of all contraception Methods as free of charges for every couple, which is useful for protecting unwanted and unplanned pregnancy, especially high risk group, increasing the knowledge of women and increasing of rate Skilled Birth attended.

Referring to WHO Report (2006) in Iran in Year 2000, 90% of pregnant women had Births Attended by Skilled Health Personnel and in Year 2001, 77% of each pregnant women received at least 4 visits as Antenatal Coverage. This rates now increases.

One of the latest strategies of Ministry of Heath since 3 years ago was starting to have at least 9 time visit during pregnancy by the trained midwife and Physicians, and clients not only check up, but also have train for receiving the chance of using complementary therapy for decreasing labor pain and also receiving counseling. This is the best way for monitoring the mothers and finding the high risk group better than previous time and referring them to the professionals on time. Referring to all mentioned since we decrease this problem but still need more work for health promotion for reaching to golden standards.

P10 - Modified Wigglesworth classification of stillbirths and neonatal deaths - Malaysia's experience

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(see abstract O47)

P11 - Challenges and strategies in addressing stillbirth in Malaysia

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A CHALLENGES

1. **Training in perinatal death reporting:** Improvement in the mechanism of reporting perinatal deaths is essential and should be continuous. The coordinator should liaise with the senior officers for verification of data on the forms before submission. There is a need to strengthen the mechanism of identifying missed reports from the private sector. Better reporting would enable more accurate and reliable data.

2. **Audit specific causes of the Perinatal deaths:** Auditing Perinatal deaths will provide an accurate magnitude of the problem of these deaths. It will identify the remediable clinical, non clinical and patient factors. Risk factors for the development of birth asphyxia should be recognized and measures taken to ensure that these mothers deliver in a unit capable of handling the problem.

3. **Pre pregnancy clinic:** Establishment of pre pregnancy clinics for Preconceptional service and to be available to those who require it. Genetic counselling: Counselling for families with genetic diseases for the reduction of chromosomal and other abnormalities. Maternal: Folic acid supplementation; Control of diabetes mellitus; Family Planning

4. **Early antenatal booking:** This will not only ensure the safe delivery of the mother but also the birth of the newborn in optimum condition. Congenital abnormalities can be diagnosed and appropriate counselling and advice on the availability of antenatal detection by serum screening, ultrasound morphology or invasive diagnostic procedures such as amniocentesis or chronic villus sampling can be offered.

5. **Provision of better obstetric care and neonatal services:** Develop an effective intrapartum monitoring tool for junior medical and nursing personnel.

6. **Prevention of Neural tube defects:** Preconceptual folate supplementation for the prevention of congenital abnormalities such as neural tube defect. The approach of giving folate supplement only to pregnant mothers now should expand to all range of reproductive age groups. Folic acid fortification in all types of flour.

Health education to create awareness especially to women in their reproductive age group: Traditional practice: To enable mothers to recognize good traditional practices and ensure harmful traditional practices are discontinued. Establish close relationship with traditional Practitioners

Conclusion: Perinatal outcomes have improved over the years, but more intensified efforts in the area of antenatal and intrapartum care are necessary. Improving patient education will result in an even higher proportion of patients booking for early antenatal care. It is envisaged that further reduction in stillbirth will depend much on tertiary obstetric and neonatal services to provide effective management.

P12 - Multivariate analysis of risk factors for stillbirth in Leon, Mexico

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Introduction: Stillbirth is the most devastating complication for the fetus during pregnancy. In developing countries the rate of stillbirth is about four-fold higher than in industrialized settings. In our country, the parents commonly do not accept fetal autopsy. This fact makes difficult to identify the causes of stillbirth. Little is known about the interaction between socio-demographic and clinical risk factors for stillbirth. Our aim was to identify the significant risk factors associated with stillbirth.

Methods: A case-control study was carried out. Seven hundred fifty-three women were included: Two hundred fifty-one patients had a stillbirth (cases) and 502 women had a healthy live birth (controls). Stillbirths were included when occurred after 21 weeks of gestation. Seventeen socio-demographic and clinical risk factors for stillbirth were analyzed. Statistical analysis included: Student's t-test or Mann-Whitney U test for continuous data, and chi-square or Fisher's exact test for categorical variables. Logistic regression analysis was used to find significant predictors for stillbirth. Odds ratios with 95% confidence intervals were estimated.

Results: Three risk factors were significant in the logistic regression model: Advanced maternal age (OR = 1.04, 95% CI: 1.00-1.08), adequate antenatal care (OR = 0.1, 95% CI: 0.0-0.2), and umbilical cord complication (OR = 5.8, 95% CI: 3.2-10.2). The whole model had a determination coefficient of 0.280, with a chi-square value 246.2 ($p < 0.001$).

Conclusions: In our setting the antenatal care should be considered as the cornerstone in the prevention of stillbirth. An adequate antenatal care could identify women with advanced maternal age; and the umbilical cord complication could be detected with the implementation of Doppler ultrasound scanning at term.

P13 - Reducing stillbirths in México

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1. Challenges for addressing stillbirth in our country:

In México in the year 2006, the rate of stillbirth was about 19 per 1, 000 live births. This high prevalence of stillbirth represents the main challenge for addressing stillbirth. One reason of this high prevalence is because in our setting many women do not attend regularly to antenatal care. Some women do not occur to antenatal care because they ignore their clinical importance. Other women do not attend regularly to antenatal care because they do not have money to pay the cost of medical attention.

This lack of adequate antenatal care makes difficult to identify some risk factors associated to stillbirth such as socioeconomic status, advanced maternal age, smoking, obesity, drugs abuse, obstetric complications in previous pregnancies and maternal diseases. Moreover, if pregnant women do not attend antenatal care the scanning with Doppler ultrasound is omitted and the diagnosis of fetal well-being and umbilical cord entanglement can not be made.

2. Strategies recommended for reducing stillbirths in México:

To promote regular and adequate antenatal care.

- To identify any possible risk factor associated to stillbirth.
- To make a closer surveillance in high risk pregnancies.
- To carry out in all pregnant women Doppler Ultrasound scanning.

P14 - An overview of perinatal death review in Nepal

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(See Abstract O7)

P15 - What are the main challenges for addressing stillbirths in Nepal? What strategies would help in addressing these challenges?

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Main challenges

1. As most of the births and deaths in Nepal occur at home and although there is compulsory registration of births and deaths, there is still problem of complete registration, it is difficult to be sure of the total number of stillbirths in the country.
2. Stillbirths in general are not discussed and reported by families because of adverse feelings in the society
3. Virtually there is little data on stillbirths from community based studies and as most of the stillbirths occur at home, the causative factors of stillbirths are not clearly known
4. Latest Demographic Health Survey (2006) has reported a stillbirth rate of 22.2 per 1000 births and a perinatal mortality rate of 45 per 1000 births a reduction of merely 2 from 47/1000 noted in the previous survey of 2001.
5. Most of the births occur at home and the latest DHS survey stated that only 19% of deliveries were assisted by a skilled birth attendant (SBA).
6. Hospital data indicate a preponderance of stillbirths to early neonatal deaths and the ratio becomes very close where there is better antenatal check up rates and obstetric care particularly better intrapartum monitoring and timely intervention.
7. Published hospital perinatal mortality data revealed that where antenatal check ups were absent or very low there was a preponderance of macerated stillbirths by as much as 3:1 ratio.
8. Stillbirth rates and particularly fresh stillbirth rates have been found to be much less in hospitals where partograph is regularly used compared to those hospitals where it is not used.
9. Perinatal death reviews are done regularly only in few hospitals in Kathmandu, the capital of the country, and in hospitals outside Kathmandu, perinatal death reviews are hardly ever done
10. The presently used definition for stillbirths in Nepal is stillbirth following 7 months of gestation or weighing 1000 grams or more at birth. Weighing is hardly done in the community and dates may not be correct. Over 85% of all births in Nepal occur at home.
11. During perinatal death reviews, macerated stillbirths are hardly ever discussed and only term fresh stillbirths are discussed virtually accepting by the hospital staff that very little could be done to macerated and low birth weight stillbirths.

12. Majority of the health personnel are not aware of perinatal death review process.
13. Postmortem examination of stillbirths is never done and anyway there is no experienced perinatal pathologists in the country hence cause of stillbirth is presumptive only and in many cases it is unknown.

Strategies to address challenges related to stillbirths

14. Birth and death registration must be made compulsory to all. More important is providing incentives and disincentives for people to be motivated to register all births and deaths. However, the tendency is for more people to register births and deaths now a days because of requirements for school administration and other activities.
15. Health personnel should be trained on perinatal death review process.
16. It should be made a rule that all perinatal deaths should be reviewed regularly in health facilities where deliveries occur and a report should be sent to a central office registry.
17. Each hospital having maternity facility should have a perinatal death review committee which should conduct perinatal death reviews regularly and suggest appropriate recommendations to the hospital management.
18. There should be a central body - Perinatal Death Review Committee to review perinatal deaths in the country and produce reports for the policy makers and the program managers.
19. To reduce the present high perinatal mortality and particularly stillbirths, quality antenatal care service should be encouraged and provided in the health facilities.
20. Partograph should be introduced in all maternity facilities
21. Good obstetric care including quality intrapartum monitoring should be made in all maternity care facilities.
22. Basic and Comprehensive Emergency Obstetric Care (BEOC and CEOC) facilities should be made available in health facilities depending on the type of health facility and geographical area.
23. Facility deliveries should be encouraged and birthing centres should be opened in places where there are no hospitals.

Health education programs encouraging women to have better nutrition and rest during pregnancy recognize danger signs during pregnancy and seek care in an appropriate health facility and conduct delivery in a health facility or at least to have a skilled birth attendant at home delivery should be extensively spread.

P16 - Recurrent foetal wastage still a problem in Sub-Saharan Africa

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Introduction: Foetal wastage is a term that aptly describes recurrent pregnancy losses usually due to preventable reasons. This is a sad aspect of the high perinatal mortality rate in sub-Saharan Africa.

Method and discussion: This paper is a case report of two multiparous mothers (none alive) with recurrent still births who both presented at the Obstetrics and Gynaecology department of the University of Uyo Teaching Hospital with intrauterine foetal demise within the same week in April 2007. Despite their previous poor obstetric histories, they still opted for unorthodox antenatal care and delivery in spiritual churches, a problem currently affecting a large proportion of the obstetric population in this environment.

Conclusion: To reduce the high Perinatal Mortality Rates in sub-Saharan Africa, specific interventions should be targeted at the strong cultural and religious which affect the optimal utilization of existing antenatal/delivery care facilities.

P17 - Stillbirths at the University of Uyo Teaching Hospital, Nigeria

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Objective: This study was designed to determine the stillbirth rate and associated maternal factors influencing this, at the University of Uyo Teaching Hospital, a new tertiary health facility in Akwa Ibom State, Nigeria.

Methods: A retrospective study of still births at the labour ward of the University of Uyo Teaching Hospital from the 1st of January 2004 to the 31st of December 2006 was carried out.

Results: There were 416 deliveries during the study period. Of these 3, 200 were live births and 216 were still births giving a still birth (SBR) of 63/1000. Majority of these still births occurred among unbooked mothers (67.6%) who belonged to a low socio-economic class. Most of them were less than 25 years of age (50.5%), were of low parity (<3) and intrauterine foetal death occurred at term in 51.9% of mothers.

Major associated maternal complications were severe preeclampsia/eclampsia, prolonged obstructed labour and uterine rupture. Others were antepartum haemorrhage, twin pregnancy, anaemia and severe malaria in pregnancy.

Conclusion: The need to improve the socio-economic status of women, provision and increased utilization of antenatal and delivery facilities is emphasized.

P18 - Challenges and strategies for addressing stillbirths in Nigeria

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Background: Stillbirths contribute a high proportion of the high perinatal Mortality rate in sub-Saharan Africa. In Nigeria, the stillbirth rate is usually underestimated and majority of these stillbirths are preventable.

Challenges for addressing stillbirths: Majority of them are fresh stillbirths occurring among unbooked mothers. Other risk factors include teenage pregnancy, elderly motherhood, high parity, prolonged obstructed labour, ruptured uterus, severe preeclampsia and eclampsia. Malaria which is holoendemic in the country is also implicated as directly or indirectly causing a significant number of these stillbirths. Others include socio-cultural factors, paucity of Emergency Obstetric Care facilities, high cost of health care and poor road infrastructure which prevent access of such facilities that are present.

Strategies for addressing stillbirths: There is a need for a population based survey to accurately assess the magnitude of the problem and help formulate policy to tackle them. Recommendations include provision of adequate antenatal care facilities which should be highly subsidized to encourage utilization and good roads to enable access, training of traditional birth attendants in rural areas to ensure prompt referral and provision of anti-malarial prophylaxis to all pregnant women. Others include women empowerment, prohibition of adolescent marriages and provision of adolescent friendly contraceptive services.

P19 - Antepartum fetal death in a Nigerian teaching hospital: aetiology and risk factors

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Introduction: Antepartum fetal death is a significant contributor to perinatal mortality. Knowledge of the causes and risk factors will help in designing preventive measures to reduce the incidence of this unfortunate problem.

Methods: In this case control study, all antepartum fetal death, with fetuses weighing 1 kg or more, delivered at Wesley Guild Hospital, Ilesa between January 1996 and December, 2000 were the subjects. The controls were all live births delivered immediately before and after every index fetal death. Information on maternal demographic details, obstetric history and antenatal complications were retrieved from the case notes of both subjects and controls for analysis.

The clinico-pathology classification of fetal deaths suggested by Baird was used in the study.

Results: During the study period there were 5, 050 total births and 389perinatal deaths, given a gross perinatal mortality rate of 77.03 per 1000 total births. Of the 389 perinatal deaths 266 (68.4%) were still-births out of which 111 (41%) were antepartum and 121 (45%) intrapartum deaths. The timing of death could not be determined in 34 (12.8%). Among the antepartum deaths 70 (63.1%) were singleton and weighed 1kg or more. The main causes of death in this group were antepartum haemorrhage (20%), maternal disease (14.3%) and pre-eclampsia / eclampsia (11.4%). The cause of death was unknown in 38.6% of cases. The main risk factors for antepartum death were lack of antenatal care and low birth weight. Maternal age and parity were not found to be risk factors.

Conclusion: Perinatal mortality is still very high in our society and the majority (68.4%) of the deaths were still-births. In order to reduce this high rate of still-birth, there is a need for improvement in the antenatal and intrapartum care with special emphasis in fetal growth monitoring.

P20 - The main challenges for addressing stillbirth in Nigeria and suggested strategies to address them

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Introduction: With a rate of 52 per 1000, stillbirth is one of the most common adverse pregnancy outcomes in Nigeria. Over the years the rate has remained steady and may be increasing. This problem requires urgent attention.

CHALLENGES FOR ADDRESSING STILLBIRTHS IN NIGERIA

Besides the general risk factors for stillbirths common to all communities such as advanced maternal age, obesity and multiparity, some factors peculiar to Nigeria, pose great challenges for addressing stillbirth. These include lack of adequate antenatal care, lack of skilled birth attendant at delivery and low socio-economic status. Only 58 percent of the mothers received antenatal care from health facilities and only 30 percent of births occurred in health facilities.

Despite a high prevalence of intrauterine growth restriction (15%) there are no facilities for fetal monitoring even in most secondary and tertiary centers. Many cases of IUGR are therefore undiagnosed and this is responsible for more than 50% of the stillbirths.

RECOMMENDED STRATEGIES TO ADDRESS STILL BIRTH IN NIGERIA

Improving the quality of antenatal and intrapartum care is key to addressing the high stillbirth rate in Nigeria. To be effective the care should be acceptable, accessible, affordable and sustainable.

Immediate steps to address the problem include public enlightenment to encourage women to utilize health facilities, upgrading of government health facilities, and provision of efficient referral system. Training traditional birth attendants and integrating them into an improved health care system may be an interim solution to manpower shortage.

Long-term strategies include training of skilled birth attendants, provision of more maternity units and encouraging government to prioritize maternal and child health.

Conclusion: Substandard antenatal and intrapartum care and poor utilization of available resources are the main challenges for stillbirth in Nigeria. Public enlightenment programmes and improvement in the standard of care are required to address these problems.

P21 - Study causes of stillbirth and evaluation of common classification systems in a developing country Pakistan

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Reliable data about causes of stillbirth are difficult to obtain in developing countries. Hospital based stillbirth data are often subject to substantial bias. Cause of death of fetus has been poorly studied in developing countries like Pakistan as 70% of deliveries occur at home with no birth or death registration and unrecorded cause of death. No study has jointly examined the spectrum of poor birth outcomes across important demographic subgroups at both hospital and community settings at the same time period. We need to study the causes of stillbirths and pathways leading from risk factors to stillbirth.

A multi-centre, hospital & population based prospective follow up study is proposed in defined geographical health districts in Pakistan. At the community level all the recruited pregnant women will be followed from 20th week of pregnancy onwards till final outcome of the delivery. In case of stillbirth a verbal autopsy and laboratory investigations will be carried. At hospital settings all the leading events will be documented. Examination of placenta will be carried for patho-physiological examination in both settings. All the stillbirths will extensively be studied related to ante partum or intra-partum timing. All the aspects of documentation of all the maternal or fetal related causes will be considered to describe by specific diagnosis.

After knowing the causes it is helpful to evaluate the most commonly used stillbirth classification systems including ReCoDe system. The classification system is designed to assist in prevention, regarding application, validity and usefulness for quality assurance. This is also helpful for practical use and for specific health care improvement activities.

The study aims at improving the situation in understanding risk factors and causes of stillbirth in a developing country setting to reduce the problem. The evaluation of common classification systems will help to assist in prevention and future comparison.

P22 - The main issues and challenges of still births in Pakistan and the ways of addressing these challenges

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There is paucity of information on stillbirths in Pakistan. Much of the available data is on perinatal mortality and on hospital based reports and birth cohorts. The exact statistics are not available as 70 % of deliveries in rural deprived areas occur at home with skeletal facilities, no medical expertise and often unrecorded. Even when recorded, the cause of the stillbirth is uncertain, as postmortems (or even examination) are uniformly absent. The estimated rates are 10 times higher than the developed world and have been unaltered and perhaps even riding for the last 20 years.

The necessary action for improvement requires. 1. A broad, large representative community involved study population must be instituted, with easily accessible referral centres. 2. Stepwise recording of data must be carried out for complete analysis, which evolves into full documentation. 3. The aim of studying stillbirth is to assist in prevention initial analysis directed to the purely clinical with untrained initial health care contacts. The dominant groups are: a) Decreased fetoplacental reserve. b) Born too soon with the aim to eliminate "mature unknown". c) Fetal abnormality and d) Clear cut obstetric causes. This grouping requires education of both first contact health worker and medical staff of primary units for early detection of fetoplacental reserve and being born too soon as standard obstetric care does not include this. This simple categorization is compatible with upgrading into the sophisticated ReCoDe system developed at Birmingham UK where all facilities are available. 4. The cure lies in the community with improvement of deprived circumstances. This requires intervention at many levels, particularly government. Nevertheless, the Flexible Response Model allows pre-pregnancy early intervention by means of the most powerful drug in the world - food. On a community basis this is the way forward to early substantial improvement in stillbirth rates.

P23 - Birth weight, preterm birth and perinatal mortality: a comparison of black babies in Tanzania and the US

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Introduction: While adverse conditions in Africa produce some of the highest rates of infant mortality in the world, it is unclear to what extent they affect birth weight and preterm delivery. We shall compare patterns of birth weight and preterm delivery between Tanzania and a lower risk country.

Methods: We examined 14 444 Black singletons (with birth weight of at least 500 g) from a hospital-based registry in Tanzania (1999-2006) and 3, 530, 366 Black singletons from US vital statistics (1995-2000). We compared birth weights, gestational ages, and perinatal mortality (stillbirths and deaths in the 1st week) of Black births in Tanzania and the US.

Main Outcome Measures were birth weight, gestational age, and perinatal mortality.

Results: Perinatal mortality in the Tanzanian sample was 41 per thousand, compared with 10 per thousand among US Blacks. Tanzanian babies were slightly smaller on average (43g), but had fewer preterm births (10.0% vs 16.2%). This difference was corroborated by the residuals of the birth weight distributions, which estimated that 3.7 % of Tanzanian babies were small and preterm, compared with 4.9 % among US Blacks.

Conclusion: The harsh conditions in Tanzania lead to high perinatal mortality rate, but birth weights are similar to those of Blacks in the US. Paradoxically, Tanzanian babies had lower rates of preterm delivery than US Blacks. This may reflect incomplete ascertainment of preterm births in Tanzania. It is also possible that social factors make US Blacks more susceptible to preterm delivery than African Blacks.

P24 - Sociodemographic inequalities in perinatal mortality among singletons in North East Tanzania: Registry based study

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Introduction: Sub-Saharan Africa has the highest known perinatal mortality rates. Few studies have assessed how differences in sociodemographic conditions affect perinatal mortality within this region. The aim of the study is to estimate variation in perinatal mortality by inequalities in parental sociodemographic factors.

Design and settings: A registry based study using births during 1999-2006 time period born at a hospital in North Eastern Tanzania.

Participants and methods: 14 394 singleton births with birth weight 500 grams and a known perinatal survival status. Births of women with residence outside the local district who were referred to the hospital for delivery for medical reasons were excluded.

Results: Perinatal mortality was 41.1 per 1000 births. Factors independently associated with higher perinatal mortality were: older paternal age (>45) compared to age 26-35 (Adjusted Relative Risk [ARR]= 2.0; 95% Confidence Interval [CI]: 1.4, 2.8), low paternal education (primary) compared to secondary or higher (ARR=1.3; 95%CI: 1.1, 1.7), paternal tribe other than Chagga or Pare (ARR=1.4; 95%CI: 1.1, 1.7), paternal farming occupation (ARR=1.5; 95%CI: 1.1, 2.2), maternal service occupation (ARR=1.7; 95%CI: 1.2, 2.6), maternal height 150 centimeters or lower (ARR=1.4; 95%CI: 1.0, 1.8) and residence in the rural or semi-urban area(ARR=1.4; 95%CI: 1.1, 1.7).

Conclusions: Inequalities in perinatal mortality due to parental sociodemographic variations exist in Africa. Paternal social factors have stronger independent influence on perinatal mortality compared to maternal social and biological factors. This may reflect a pattern of social or cultural influences on perinatal mortality.

P25 - Challenges in addressing stillbirths in Tanzania

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Of the estimated global 3.3 million stillbirths, 98% occur in developing countries, with sub-Saharan Africa having the highest rates. Over half of births in sub-Saharan Africa take place at home and mostly without skilled attendance. Due to poor registration coverage of births occurring outside health facilities the stillbirth problem in home births is largely unknown and the overall number of stillbirths likely underreported.

This paper reviews magnitude of the stillbirth problem, risk factors and challenges faced in Tanzania. By WHO (2006), Tanzania was estimated to have a stillbirth rate of 38 per 1000 births. A range from 15-98 per 1000 births has been reported in different hospital-based studies in various areas of Tanzania.

A community based study in Northern Tanzania reported intrapartum deaths contributing to 45% of all stillbirths. A hospital-based study in Northeastern Tanzania showed 42% of stillbirths were fresh stillbirths indicating fetal death occurred <12 hours prior to delivery. The high proportion of intrapartum deaths reported is an indication of lack of appropriate care during childbirth.

Maternal syphilis infection is known to contribute to majority of stillbirths, followed by anemia, previous stillbirth history and malaria in pregnancy. Other risk factors include short stature (<156 cm), low socioeconomic status and rural residence.

Challenges in addressing stillbirth problem include incomplete registration stillbirths occurring outside facility based setting. Furthermore, syphilis screening is not available to all women attending ANC clinics due to limited resources, sub-optimal emergence obstetric care in hospitals designated for referral is made worse by overcrowding of delivering patients (mostly with non-risky pregnancy) due to poor referral system.

Screening of syphilis should be optimized, malaria prophylaxis and iron folate made available to all pregnant women. Women should be encouraged to deliver in health facilities, referral system and quality of care in the health facilities must be optimized. Living conditions especially in rural areas and access to health care in the rural areas have to be improved.

P26 - Infection and perinatal loss in Vietnam

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The Institute for Reproductive and Family Health (RaFH) is working in the fields of gender, sexuality, reproductive and family health. Stillbirth and perinatal loss reducing to 18 ‰ (the current figure is 22 ‰) is a strategy on maternal and child health care in 2010 of Vietnam. The situation of RTIs is 69% of women infected. The figure is even higher in rural areas. Moreover, unhygienic condition of delivery baby and unclean water results in RTIs increase.

Recently, the number of STDs and RTIs and HIV/AIDS infection at reproductive age in Vietnam is increasing leading stillbirth and perinatal loss become emergency problems. In particular in prenatal clinics, they do not pay attention to treatment and care of STDs, RTIs and HIV/AIDS and they are not aware of issues related to mother and child rights.

An intervention action to integrate prevention, care and treatment for RTIs, STDs and HIV/AIDS before and during pregnancy is urgent for reducing the rate of stillbirth and perinatal loss.

P27 - Confidential enquiries to assess stillbirths in the Republic of Moldova

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Background: A Confidential Enquiry was commenced to investigate the cause of perinatal death in fetuses and newborns with birthweight e2.5 kg in Moldova. The study was under the auspices of the FIGO Saving the Mother and Newborns Project (2006-2010) and assisted by the West Midlands Perinatal Institute. Here we report on a pilot of the Enquiries which included stillbirths >2.5 kg.

Methods: The Enquiry was conducted with reference to nationally agreed standards for antenatal and intrapartum care. A questionnaire was developed and cases were reviewed by clinicians who have not been involved in the care of the patients. Stillbirths were classified using the ReCoDe system. The case notes were fully anonymised and examined by expert panels and graded for the quality of care.

Results: To date, 38 cases of stillbirth have been assessed. The ReCoDe classification included fetal causes in 18 cases (47.3%), including infection 2, iso-immunization 2, IUGR 14; umbilical cord related: 9 (24,0%); placenta 4 (5.5%); trauma 3 (7.9%), uterine rupture 2 (5.2%); 2 (5.2%) cases were not categorized.

The main findings about the antenatal care in the cases resulting in stillbirths were as follows: 40% of women had late booking (after 12 weeks gestation), only 47% of them received folic acid and 66% - Iron (Fe) supplements, and only 21% were evaluated as to their risk group in pregnancy. The antenatal growth chart was filled out in 47% cases. 37% of the stillbirths were IUGR, but only 21% of these were diagnosed during the antenatal period. 52.6% of women mentioned that they have been informed by the family doctor about the risk of the decrease of the fetal movements for the fetus; nevertheless only 31.5% of the women who felt a decrease in fetal movements reported this to the family doctor.

In 35 of the 38 cases (92%), panels considered that the care provided was sub-optimal, including 22 (58%) Grade 2 and 13 (34%) Grade 3. Lack of services featured in 65.7%, while in 21.0% the counseling, diagnosis, and / or recording was sub-optimal; in 7.9 % cases accessibility to medical care was lacking while factors relating to the woman, family and social conditions was a cause in only 5.2%.

Conclusions: In 92% cases of stillbirths with weight e2.5 kg, the medical care was substandard. IUGR as a cause of stillbirth was determined in every 3rd case. For the reduction of the number of stillbirths caused by IUGR, it is necessary to strengthen the use of the antenatal growth chart by the family doctors; of the counseling of the pregnant women on the supervising of the fetal movements and training of doctors to address changes and to induce early delivery when indicated.

P28 - Comparison of total cost between occurring stillbirth and presenting a prevention model in Iran in 2006

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Introduction: Based on econometric studies conducted worldwide and in IRAN, one of the methods by which the efficiency and effectiveness of an organization is evaluated, is by cost - control methods and economical analyses of therapeutic activities that must be carried out routinely and periodically. It seems that by use of preventing model we can decrease the cost of services in health care system, This study aims to propose a model by which the provided services can be expanded in a preventing program before occurring problem.

Methods: This Cross-sectional retrospective experimental study calculated hospital costs and analyzed the data in forms and tables designed especially for this purpose.

Also data in regard to capital and current costs were calculated in 35-40 years old women that admitted in the hospital.

Results: In this study, econometric analyses of occurring stillbirth to compare of prevention model demonstrated that the health services cost of inpatient after occurring stillbirth was 3.2 times greater than use a model of preventing in the same hospital .The most costs of preventing program includes preparation of education course and the number of visits in the clinics.

Discussion and conclusion: As it is observed all over the world, health care personnel pay less attention to the costs of inpatient services and less aware of the economical aspects of health care services, especial the importance of preventing and education program that help us to control some problems . Without considering the costs, according to nature of our job, it's important to prevent some harmful events. Having knowledge about the costs is not only essential for hospital administration but also for all medical personnel, since with more cost reduction, a greater number of people can enjoy medical services.

P29 - Causes of stillbirth

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Background: Death of a fetus happens in about 1% of pregnancies

Goal: To analyze causes of stillbirth

Material and methods: Systematic review of the worldwide literature on the causes of stillbirth.

Results: Frequency of causes of fetal death: Infection 15%, congenital anomalies, preeclampsia, fetal growth restriction, umbilical cord complication, fetomaternal transfusion, nonimmune hydrops, abruption placentae, asphyxia during labor, twin to twin transfusion, coagulation disorders, isoimmunisation, uterine rupture, antiphospholipid syndrome, Sjögren's syndrome, unexplained. Infection is a significant risk for the fetus cause severe repercussions of intrauterine bacterial infections. Ascending bacterial infections leads to fetal damage, preterm delivery, and in severe cases, intrauterine fetal death. Ascending subclinical intrauterine infection may play an important role in the etiology of otherwise unexplained late prelabor fetal death. Fetal death associated with asymptomatic intrauterine candida albicans infection and a retained intrauterine contraceptive device. Parvovirus infection was a relatively common cause of mid-trimester fetal death. Many fetuses dying because of this infection are not noticeably hydropic, and the possibility of parvovirus infection should be considered in any case of intrauterine fetal death.

Conclusions: The presence of parvovirus B19 DNA in cases of late second-trimester and third-trimester fetal death is common, and most are non-hydropic. The sensitivity of conventional diagnostic procedures for intrauterine fetal death could be greatly improved by addition of parvovirus B19 PCR.

P30 - The contribution of late termination of pregnancy to stillbirth rates

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Background: Any fetus delivered after 24 weeks gestation, and showing no signs of life, is legally required to be registered as a stillbirth, even if death follows termination of pregnancy (ToP). Stillbirth rates have failed to decline in recent years, and the reasons for this are unclear. There is little data on the contribution of late terminations to stillbirth rates at a population level.

Objective: To explore the contribution of termination of pregnancy to recorded stillbirth rates

Methods: Review of terminations of pregnancy between 1994-2005 to women resident in the Northern Region of England and recorded as stillbirths by the regional Perinatal Mortality Survey.

Result: There were 175 legal ToPs after 24 weeks gestation and 2246 total recorded stillbirths. The proportion of stillbirths recorded as ToPs increased from 5.6% in 1994-97 to 9.1% in 1998-2001 and 9.2% in 2002-2005. 61% (107) of the ToPs occurred at 24-27 weeks' gestation, 18% (32) at 28-31 weeks and 21% (36) at 32+ weeks. 79% (138) were performed for fetal abnormalities, most frequently for chromosomal anomalies (54; 31% of all ToPs resulting in stillbirth), CNS anomalies (39, 22%) and cardiovascular anomalies (18, 10%).

The stillbirth rate was 62.9 per 10, 000 total births in 1994-97, 55.5 in 1998-2001 and 58.7 in 2002-2005. Excluding ToPs, the stillbirth rate was 58.8 in 1994-97, 50.4 in 1998-2001 and 53.3 in 2002-2005.

Conclusion: Inclusion of ToPs after 24 weeks in stillbirth statistics overestimates the true stillbirth rate, by nearly 10% in our region. Late termination rates have increased since the mid 1990s, but this does not explain the recent rise in stillbirth rates.

P31 - Emphasis of WBC count changes after cesarean delivery and postoperative infections

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Objective: To determine the relationship between changes in white blood cell (WBC) counts after cesarean and risk assessment of postoperative infections.

Study design: WBC count was measured at admission and on postoperative time within 24 hours for 315 women who had cesareans at Shariati Hospital of Tehran University of medical sciences. Information from charts was abstracted, and definitions of infectious outcomes and fever were applied by three physicians masked to laboratory results. Statistical analysis performed for postoperative infection, absolute and relative changes in WBC counts.

Results: Among 315 subjects, 128(40.6%) actively labored before cesarean and 187(57.8%) did not. 32(10.2%) participants developed postpartum infection, 10 had endometritis, 8 urinary infection, 8 wound healing complications, 4 mastitis and two had pneumonia. In those who had infection after cesarean, the mean (+/- standard deviation [SD]) postpartum day 1 WBC count was 19.1 ± 3.4 cells/mm3_ 103; compared with those who had not infection 18.2 ± 2.9 cells/mm3_ 103.

In this study there was a strong relationship between postoperative infection and changes in WBC count, ($P < 0.001$). Labored women in this survey had significant higher WBC count ($P < 0.001$) compared with those who did not.

The relation of endometritis and percent change of WBC count was meaningful but the other types of infections had no association with this variable separately, ($P= 0.7$).

Conclusions: We found a strong association between changes in WBC count and presence of postoperative infection. Although labor influenced post-cesarean WBC counts but it did not cover changes associated with infection.

P32 - Obstetric management and perinatal outcome of extreme prematurity: a retrospective study

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Aims and objectives: To study maternal risk factors and the neonatal outcome in extremely premature infants managed in a tertiary referral centre.

Methods: In this retrospective study, data was collected on premature births from 22 to 27 completed gestational weeks between April 2004 and March 2005. Neonatal survival at 7days, 30 days and at discharge/90days was assessed in relation to gestational age, birth weight, maternal risk factors, sex of baby and mode of delivery.

Results: Of 57 babies were delivered in 49 women, 26% were stillborn, 4 not resuscitated / died in the delivery room and 67% neonates were admitted in NICU. Overall survival at 7 days, 30 days and at the time of discharge/ 90 days was 44 %, 40 % and 33 % .10% of neonates admitted to NICU died in <24 hours, 66 % survived 7 days, 59% survived 30days and 47 % were discharged from hospital. Gestational age of the neonate was the single most important parameter related to survival at 7 days (p=0.046), 30 days (p=0.081) and 90 days/discharge (p=0.000).Survival rates based on all births increased from 0% <24 weeks, 8 % at 24 weeks to 60 % at 27 weeks. Survival rate was <5% in neonates <600gms, 20-25% at 600-900gms and >60% in neonates with birth weight >900 gms. Male sex was associated with poor survival (20.6%) as compared to 52.2% survival in female neonates (p=0.007). Caesarean section was carried out in 16/49 mothers and 18 /36 (50%) babies above 25 weeks gestation.12.5% babies born by CS <27 weeks survived compared to 60% in neonates delivered by CS > 27 weeks. Hypertensive disorder was the most common maternal medical complication and responsible for 7/16 caesarean sections.

Conclusion: Management of neonates at threshold of pre-maturity continues to challenge obstetricians and neonatalogists and should be individualised.

P33 - Pregnancy outcome after previous late fetal loss or stillbirth

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Introduction: Late fetal loss and stillbirth are well-accepted risk factors for increased mortality and complications in subsequent pregnancies. Little is known about the overall outcome of the first subsequent pregnancy. The purpose of this study was to evaluate first pregnancy outcome after previous late fetal loss and stillbirth.

Materials & methods: Within our perinatal database, women with a history of late fetal loss or stillbirth were identified, in the period between January 1999 and December 2004. Miscarriage was defined as fetal loss before gestation of 16 weeks and late fetal loss as fetal death during the period of gestation of 17 until 20 weeks. Stillbirth was described as death of the fetus after gestational age of ≥ 20 weeks. All medical records until August 2006 were reviewed to collect clinical obstetric and paediatric data of the first pregnancy after late fetal loss or stillbirth, the index pregnancy.

Results: Out of 163 women 119 (73%) women had an ongoing pregnancy, 16 (9.8%) women had a miscarriage and 28 (17.2%) women did not become pregnant again. Compromised obstetric outcome was defined as miscarriage, late fetal loss, stillbirth, neonatal death and abstaining from pregnancy. In total 53 women (32.5%) had a compromised obstetric outcome after the index pregnancy. Out of these 53 women, 16 women were primiparae during the index pregnancy and had not given birth to a living child since then. Out of 125 children, the number of perinatal mortality was 10 (8.0%) children (table 1). Perinatal mortality was defined as the number of stillbirth and early neonatal death.

Pregnancy outcome	n (%)
Late fetal loss (gestational age 17-20 weeks)	2 (1.6%)
Stillbirth (gestational age ≥ 20 weeks)	8 (6.4%)
Early neonatal death (≤ 24 hours)	2 (1.6%)
Living children (≥ 28 days)	113 (90.4%)

*113 single pregnancies and 6 twin pregnancies

Conclusions: Pregnancy outcome of the first pregnancy after previous late fetal loss or stillbirth is poor with high perinatal mortality.

P34 - Outcome of non diabetic macrosomic babies and influence on perinatal morbidity

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Introduction: Fetal macrosomia represents a continuing challenge, as it has risk of shoulder dystocia leading to transient or permanent fetal, maternal injury and medico-legal liability. This could be very expensive to the families and to the society.

Methods: This is a retrospective analysis of babies weighing 4500gm or more during the year of 2006, at the East Sussex Hospitals. We looked at the risk factors for macrosomia, delivery outcome and maternal and fetal complications.

Results: The incidence of macrosomia of 4000gm or more during this period was 10% while that of 4500gm or more was 1.5% (n-60). Majority of these patients were Caucasians, para 1, and non-smokers. 87% continued beyond due date, while 33% continued beyond 40+10 days.

Labour/delivery outcome - 58% had spontaneous vaginal delivery, 9% had instrumental delivery, 22% underwent emergency and 11% elective caesarean section. Average duration of 1 stage of labour was 4:32 hrs and second stage 1:04 hrs. 25% of the patient experienced postpartum haemorrhage of 500- 1000ml and 20% in excess of 1000mls.

Perinatal outcome - 2 out of 60 babies weighed more than 5000gms. 16 cases had shoulder dystocia but only 3 needed manoeuvres other than McRoberts. All these 3 babies were admitted to SCBU including one who suffered with brachial plexus injury. 7 babies had Apgar scores less than 4 at 1 minute, and all had scores more than 7 at 5 minutes.

Discussion: The most common risk factor for macrosomia was post dates and majority were unexplained. Overall rate of vaginal delivery was 67% with caesarean section rate of 33%. 1.67% of the babies suffered with brachial plexus injury (Incidence - 0.03% i.e. 1:3, 000). The prenatal diagnosis remains imprecise. Pre-pregnancy and ante-partum risk factors have poor predictive value.

Conclusions: Even with the babies weighing more than 4500gm, allowing spontaneous labour gives the most likely chance of vaginal delivery with no overall increase in brachial plexus injury.

P35 - Vasa praevia - a preventable tragedy

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Vasa praevia is not a rare obstetric complication which carries a significantly high fetal mortality rate if not recognised prior to rupture of membranes. Vasa praevia occurs when fetal vessels run unsupported over the cervix ahead of the presenting part. The tragedy of fetal death from a ruptured vasa praevia is preventable in the majority of cases. Unfortunately the condition is considered to be rare and antenatal diagnosis is not made in most cases as screening for vasa praevia is not included in the protocol during routine anomaly scan. Therefore preventing fetal death is not possible in undiagnosed cases.

If diagnosed in antepartum period, prognosis is extremely good as elective caesarean section is performed at about 36 weeks ideally before membrane rupture reducing perinatal mortality and morbidity. More than 96% of infants survive when the condition is diagnosed prenatally. There are very few conditions where prenatal diagnosis leads to such a dramatic improvement in the outcome.

Vasa praevia can be detected during pregnancy as early as the 16th week with use of transvaginal sonography in combination with colour Doppler. Changing current routine obstetrical ultrasound protocols to include checking the placental cord connection especially for high risk cases such as velamentous cord insertion, low lying placenta, IVF and multiple pregnancy during routine obstetric ultrasounds is recommended (preferably with color Doppler).

We report 3 cases of vasa praevia presenting as ante and intrapartum bleeding. Two of them had associated suspected low lying placenta. This occurred within four years (2002-2006) in a small DGH with a delivery rate of 1800 per year.

Conclusion: The purpose of presenting these case reports is to warn others of the need for vigilance, antenatally. Sonographic prenatal diagnosis and careful perinatal management have the potential to prevent the overwhelming majority of fatal outcomes associated with vasa praevia.

P36 - True umbilical cord knots - clinical significance

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True knot of the umbilical cord is a rare occurrence, which is difficult to diagnose antenatally, even with the use of ultrasound. Constriction of a true knot of the umbilical cord may lead to obstruction of the fetal circulation and subsequent intrauterine death. Fetuses with true umbilical knots are at a four-fold increased risk of stillbirth, but little can be done to prevent fetal deaths during pregnancy. Surviving fetuses with true knots are likely to suffer temporary distress during delivery, but affected newborns recover soon after birth. Patients with hydramnios, who had amniocentesis and those carrying male fetuses are at an increased risk for having true knots of the umbilical cord. Thus, careful sonographic and Doppler examinations should be seriously performed in these patients for detection of the complication of the umbilical cord. But true knots of the umbilical cord do not have a characteristic appearance in utero and therefore are easily missed at routine prenatal ultrasonography.

We present two cases of true knots of the umbilical cord both of which were not diagnosed antenatally. The contrast in the outcome between the two cases is a complete normal baby after a vaginal delivery in one and an intrauterine death in the other.

Colour Doppler imaging, Doppler flow velocimetry, and three-dimensional ultrasound may further help in prenatal diagnosis of this condition. Doppler flow velocimetry assists in detecting impaired or deteriorating umbilical artery flow reflecting increasing cord compression prior to the onset of adverse and potentially nonreversible effects upon the fetus.

Conclusion: Until now it is not definitely known whether true umbilical cord knots lack clinical significance or it needs a careful search in the antenatal period. Further research in this field is needed.

P37 - Analysis of stillbirths at a teaching hospital over a 2 year period

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Introduction: The area covered by Birmingham Heartlands Hospital in West Midlands is known to have a high stillbirth rate. An increasing trend in stillbirth figures was noted at the trust during the first quarter of 2003. A detailed analysis of all stillbirths was carried out over a 2 year period to identify areas of sub-optimal care and improvement.

Methods: All stillbirths that occurred at Birmingham Heartlands and Solihull Hospitals over a 2 year period from April 2003 to June 2005 were analyzed on a quarterly basis. Analysis was based on the maternal and fetal risk factors for stillbirth and quality of care provided. The cases were graded according to the CESDI scores and classified according to ReCoDe.

Results: There were 113 cases of stillbirths giving an annual stillbirth rate of 7.5/1000 for that period. Half the population belonged to the ethnic minorities. A quarter of the patients booked late in pregnancy. 40% of the stillbirths occurred under 32 weeks gestation and early onset FGR was the relevant cause of death in this group. Antenatal detection of SGA babies was poor. FGR was the most relevant condition at death (39%). More than half the number of stillbirths involved babies with birth weights below the 10th centile for gestational age on the customized growth chart. Only 6% of the cases were graded CESDI grade 2 or 3.

Conclusions: This study highlighted areas for improvement within the directorate, in particular the early detection, monitoring and timely delivery of the growth restricted fetus, the need for early booking and risk assessment of pregnant patients in addition to pre-pregnancy counseling and satisfactory glycaemic control of the diabetic patients.

P38 - The determinant factors of unexplained ante partum stillbirth among nullipara in Scotland

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Introduction: Many studies and reports mention that unexplained ante partum stillbirth is higher compared to other causes of stillbirths in almost every country in developed and developing countries. With a period of almost 40 weeks until delivery, it would be very helpful if pregnancies that have the potential to end in unexplained ante partum stillbirths could be detected earlier for prompt management.

Methodology: This study was conducted using a database on the SMR02 record to identify the determinant factors related to unexplained ante partum. The study was comparing the unexplained ante partum stillbirth with other outcome. Samples were selected from singleton, nullipara pregnancies with a gestational age of 20 weeks and above and with a birth weight of 200g.

Result: The results showed that a maternal age of 35 years and above, smoking during pregnancy, a maternal height of less than 160cm and an increasing gestational age of above 37 weeks were strongly significantly associated with unexplained ante partum stillbirths. The probability of unexplained ante partum stillbirth was based on the risk factors identified (a maternal age of 35 years and above, smoking during pregnancy and maternal height of less than 160cm). Based on screening diagnostic tool analysis it showed that in a population the nullipara, antenatal mother without the other risk factors identified has a 99.8% chance of not having an unexplained ante partum stillbirths.

Conclusion: Chance of unexplained ante partum stillbirths was higher after 37 weeks of gestation, it is wise to closely monitor in the last weeks of pregnancy for the mother who has at least one of the identified risk factors.

P39 - Management of HIV positive women in pregnancy in low prevalence population

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Introduction: HIV in pregnancy is associated with maternal and neonatal morbidity and mortality. The risk of mother to child transmission can be minimised to less than 2% with anti-retroviral therapy, delivery by caesarean section and exclusive artificial formula feeding (BHIVA 2005 and RCOG 2004)

We report our experience in managing these women in maternity services where the prevalence of HIV in pregnancy is less than 0.5%.

Methods: A retrospective review was conducted on 25 HIV positive women who booked for antenatal care in a 36 month period from 2003 -2006. Both Obstetrics and Genitourinary Medicine case notes were reviewed.

Results:
Patients: 36% were relatively old i.e.35 years or over; 84% were from Sub-Saharan Africa; 17% were non-English speaking

Diagnosis: HIV screening uptake figure in our hospital is 87%; In our study, 40% were diagnosed prior to index pregnancy but 30% of these requested repeat testing.

All had treatment with anti-retroviral therapy13% were started in 3rd trimester; 91% women were on combination therapy; 64% had pre-labour caesarean section, 18% had emergency CS (came in early labour); 4 had vaginal delivery of which 3 were planned and one had pre-mature and rapid delivery;

None of the neonates were breast fed.

We had problem with rates in following areas:Hep.C screening, Genital swabs, Repeat VDRL, Prophylactic antibiotics during delivery

Neonatal outcome: So far, none of the infants have been reported to be infected.

Conclusion: Despite the very low prevalence of HIV in our population and the challenges this group of patients present, we achieved high compliance with national recommendations. We believe this is the result of close and effective team work and clear individual plans of care in the case notes.

P40 - Fetal death certificates as a source of surveillance data for stillbirths with defects

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Background: Stillbirth (intrauterine death at 20 or more weeks of gestation) accounts for almost 50% of perinatal mortality. Although fetal deaths are by law a reportable event, use of vital records for surveillance has been problematic, and reliable population-based registries are needed to conduct etiologic studies and evaluate prevention strategies. We evaluated the completeness of ascertainment of stillbirths with birth defects issued a fetal death certificate (FDC) and the quality of information they provide by linkage with data from the Metropolitan Atlanta Congenital Defects Program (MACDP), a population-based birth defects surveillance system.

Methods: Stillbirths with defects in MACDP were identified from 1994 through 2002 and linked to FDCs using a deterministic matching process. The sensitivity of FDCs for capturing stillbirths with defects was estimated, and predictors for a stillbirth with a birth defect being issued a FDC were assessed. Concordance for selected variables from each data source was evaluated.

Results: Two hundred twenty-four of 257 stillbirths with birth defects in MACDP were linked to a FDC (linkage rate = 87.2% [95% CI, 82.4-91.0]). Stillbirths of non-Hispanic Black and Hispanic/other mothers were more likely to be issued a FDC (OR = 5.6 [95% CI, 1.9-17.0] and 14.0 [95% CI, 1.7 - 114.0], respectively). Cases undergoing autopsy were more likely to be issued a FDC [OR = 3.2 (95% CI, 1.1-8.7)]. The sensitivity and PPV of FDCs for selected classes of defects ranged from 10% to 70% and 25% to 93%, respectively.

Conclusions: MACDP's active case identification improves the ascertainment of stillbirths with birth defects and the quality of certain recorded data. The expansion of existing active, population-based birth defects surveillance programs to include information on stillbirths could potentially enhance the completeness and quality of the data derived from fetal death vital registries. Pilot projects designed to evaluate the feasibility of such an expansion are needed.

P41 - Elective terminations and estimates of the prevalence of birth defects among stillbirths

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Background: Congenital anomalies are recognized causes of some stillbirth, but the proportion of stillbirths associated with birth defects remains unknown. A recent population-based study found that 13.5% of stillbirths had a major congenital anomaly. That study was conducted in a population with a low rate of elective pregnancy termination. However, with greater capacity to identify birth defects prenatally, more women are electively terminating birth defect-affected pregnancies, some of which could result in stillbirths without the intervention. This study estimated the prevalence of birth defects among stillbirths in a population with high rates of elective terminations for pregnancies affected by birth defects.

Methods: Cases of stillbirths and elective pregnancy terminations occurring at 20 weeks gestation or greater from 1994 to 2003 were obtained from the Metropolitan Atlanta Congenital Defects Program (MACDP). MACDP is a birth defects surveillance program that actively monitors the occurrence of malformations among infants and fetuses born to mothers residing in the five central counties of Atlanta.

Results: For the years 1994 through 2003, MACDP ascertained 344 (2.2%) stillbirths, 394 (2.5%) terminations, and 15, 138 (95.3%) live births with birth defects. There were a total of 458, 831 live births and 4550 stillbirths among resident mothers in the 5-county MACDP catchment area for this time period. The overall prevalence of defects among stillbirths was 7.6% compared with 3.3% among live births. If all terminations are included with stillbirths, the prevalence increases to 16.2%. The prevalence of chromosomal abnormalities among all stillbirths was 2.3% compared with 0.22% among live births. The prevalence increased to 5.9% if all terminations are included with stillbirths.

Conclusions: Clearly not all electively terminated pregnancies affected by a birth defect would result in a stillbirth without the intervention. Nevertheless, the interpretation of prevalence estimates of defects among stillbirths needs to also consider rates of terminations among pregnancies affected with birth defects.

P42 - Information and communication about autopsy for parents of stillborn infants

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Background: Autopsy examination remains the gold standard investigation for stillbirth, however in many regions autopsy rates are declining. Parental consent is considered the reason for this decline. Research to inform best practice in communicating information to parents making decisions about an autopsy examination after stillbirth is limited. Deficiencies in these practices may impair informed decision-making adversely influencing the autopsy rate, and may have long term negative consequences for bereaved parents.

Methods: Pilot data were gathered on how information for autopsy consent is communicated from parents who had experienced stillbirth as a part of the revision of the PSANZ Mortality Guidelines. Seventeen parents (14 mothers and three fathers) participated in focus group sessions. The majority had consented to an autopsy however the death remained unexplained. Sessions were taped and content analysis was undertaken.

Results: Parents' most frequent comments related to their inability to make informed decisions about autopsy due to overwhelming shock and grief and their dependence on others for decision-making. One parent did not understand that the investigation was optional, and some participants said they felt dependent on health professionals to make the decision. Three parents did not recall any conversation with their care providers about the option of autopsy. All agreed that written information about an autopsy, as well as that given verbally, was important. Eight parents had no recollection of receiving written information. The need to involve others such as grandparents and friends to help interpret information was important to parents. Some parents felt it was the responsibility of the care provider to make the decision on their behalf. Others felt vulnerable because of perceptions that their care provider lacked objectivity from concerns about possible clinical error, and would have preferred to discuss the option of autopsy with a third party. All parents who did not have an autopsy performed expressed regret or some doubt about their decision. No parent who had an autopsy performed expressed these feelings. Parents frequently raised concerns about clinical staff seeming inadequate in coping with the event of stillbirth. They said that some staff seemed "scared" and did not appear to have an understanding of how parents respond to loss of a child. Many parents suggested health care providers be given special training in communicating after a stillbirth. Satisfaction with information and counselling about autopsy appeared to be related to trust in the heath care provider and displays of compassion and understanding of parents' experience.

Conclusions: These pilot data support the need to improve care in relation to autopsy consent practices.

P43 - Uptake of perinatal mortality audit guidelines: a survey of midwives and doctors in Australia and New Zealand

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Background: The PSANZ developed clinical practice guidelines for perinatal mortality audit including investigations for stillbirths and neonatal deaths in May 2005 and were disseminated widely.

Aims: To identify the use and impressions of clinicians in Australia and New Zealand (ANZ) on the PSANZ Guidelines on Perinatal Mortality Audit and to identify barriers to uptake.

Methods: Following approval from the Directors of Obstetrics and Midwifery or equivalent a telephone survey was undertaken of the lead midwife and doctor in charge of birth suites of maternity hospitals in ANZ with 1000 births or more annually. The survey was undertaken in November 2006 and February 2007.

Results: A total of 79 hospitals were identified as eligible for inclusion and 67(total of150, 000 births/yr) agreed to participate. 119 surveys were completed (55 doctors and 64 midwives). 76% of responders indicated that they were aware of guidelines or protocols in their hospital on perinatal mortality review. 35% of responders were aware of the PSANZ guidelines and, of these, one third reported using them routinely in their practice; all users reported a high degree of satisfaction with the guidelines. Attendance at perinatal mortality review meetings was higher for medical staff than midwives with 40% of midwives reporting Never or Rarely attending. 50% of doctors and 30% of midwives reported Never receiving feedback on the results of perinatal mortality audit meetings. All responders Agreed or Strongly Agreed that following a perinatal death all parents should be offered the option of an autopsy. The majority reported that the consultant or registrar should approach parents for consent. 30% of midwives reported that midwives should approach parents. 80% reported that there is a training need for clinicians in counselling parents about an autopsy.

Conclusions: Use of the PSANZ Guidelines appears less than optimal and some perinatal mortality audit practices across ANZ may not be in line with best practice recommendations. There is a need for providing training for clinicians in counselling parents about an autopsy examination.

P44 - Reducing stillbirth and improving care for affected families through high quality research, clinical practice improvement and raising public awareness.

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ANZSA Steering Committee. ANZSA Coordinating Centre, Mater Mothers' Hospital, Brisbane, Australia

What is ANZSA? Australia and New Zealand Stillbirth Alliance (ANZSA), brings together an experienced and committed group of researchers, parents and health care providers to address the problem of stillbirth in ANZ. ANZSA is focussing on stillbirth prevention through conduct of high quality research and improving clinical practice in maternity care settings. ANZSA has grown from the work of the Perinatal Society of Australia and New Zealand (PSANZ) Perinatal Mortality Group and the collaboration with parent organisations particularly, SIDS and Kids, Stillbirth and Neonatal Death Support (SANDS) and more recently with the NSW Stillbirth Foundation. ANZSA has strong links with the International Stillbirth Alliance.

Vision The vision of ANZSA is to reduce the number of stillbirths in Australia and New Zealand and to ensure families receive the best possible care around the time of stillbirth.

Objectives for the first 12 months of operations

- To identify stillbirth research priorities for ANZ and to support and undertake high quality collaborative research which addresses these priorities;
- In collaboration with relevant government agencies, to establish clinical networks across all major maternity hospitals in ANZ to:
  - improve the quality of clinical practice relating to stillbirth prevention including bereavement care for parents and families
  - improve the quality of investigation, audit and classification of stillbirths
  - enhance the conduct of high quality research;
- To serve as a centralised resource for sharing information, consulting and connecting organisations and individuals;
- In partnership with parent organisations, to put stillbirth on Australia and New Zealand's social, political and research agenda;
- To engage the community and health care professionals in stillbirth prevention with particular emphasis on those most at risk (eg Indigenous, low socio-economic, smokers, older mothers).

Major achievements to date

ANZSA has been awarded funding from the Commonwealth Department of Health and Ageing, Canberra to establish a secretariat to support its functions. ANZSA will collaborate with ISA to undertake the work of ISA in ANZ.

P45 - Causes of stillbirth by gestational age and the role of induction for premature rupture of membranes in the early losses

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Brigham and Women's Hospital Boston USA

Introduction: Pre-viable spontaneous rupture of membranes is a relatively common problem in obstetrics. After counseling, it is common practice to actively induce these pregnancies to reduce the risk of complications in the mother. We calculated the stillbirth rate both by including and excluding these cases in order to assess the effect on the definition of stillbirth.

Methods: We classified the primary cause of death in 146 stillbirths (from a total of 25, 212 births) over a 3 year period at Brigham and Women's Hospital.

Results: We found that 28% (9 of 32) of the early losses from 20-24 weeks of gestation that were diagnosed with premature rupture of membranes or infection were managed with induction of labor. If these fetal losses were classified as stillbirths, the stillbirth rate would be 5.8/1000; if these were classified as induced abortions the rate would be 5.4/1000.

COD	20-24 wks	25-29 wks	30-34 wks	35-39 wks	40+ wks	Total
Unexplained	9	9	10	11	3	42 (29%)
Abruption	5	2	2	1	0	10 (6.8%)
IUGR/Placenta	6	3	2	0	0	11 (7.5%)
Malformations	2	3	2	3	0	10 (6.8%)
Twin-twin	6	2	0	0	0	8 (5.5%)
Infection/prom	32	0	0	0	0	32 (22%)
Cord	0	0	1	3	1	5 (3.4%)
Maternal disease	2	0	4	3	0	9 (6.0%)
Other	14	1	3	1	0	19 (13.0%)
Total	**76 (52.1%)**	**20 (13.7%)**	**24 (16.0%)**	**22 (15.1%)**	**4 (2.7%)**	**146 (100%)**

Conclusion: The frequency of stillbirth can differ by 8% depending on inclusion or exclusion of pre-viable fetuses presenting with spontaneous rupture of membranes.

P46 - Missed opportunities in the management of pregnancies complicated by decreased fetal movement

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Introduction: Pregnancies that are complicated by the history of decreased fetal movement have been estimated to be at a 4 to 7-fold increase in the risk of stillbirth. The goal of this case series was to assess opportunities for a better outcome.

Methods: Within the context of an IRB approved prospective study of pregnancies that reported decreased fetal movement; we reviewed all of the stillbirths that were 28 weeks of gestation or greater that occurred during a 14 months study from April 1st 2005 to June30 2006. Among the 13, 331 births that took place there were 62 stillbirths (Rate 4.6/1000). In 24% (N=15) of stillbirth cases decreased fetal movement was the main maternal complaint.

Case	GA	Wt (gms)	% Wt	DFM	Evaluation	COD
1*	39 5/7	2673	3	4 days	NST 2 days prior	Placental
2	41 3/7	4533	97	12 hrs	BPP 2 days prior	Unexplained
3	36 6/7	2470	4	2 days	No	IUGR
4	37 4/7	2693	19	1 day	No	Unexplained
5	36 5/7	3167	90	12 hrs	No	Cord
6	34 0/7	1424	<1	2 days	No	IUGR/Cord
7	32 2/7	1830	32	9 hrs	No	Cord
8	30 4/7	1021	<1	17 days	No	IUGR
9	28 2/7	1221	19	15 days	NST 2 days prior	Unexplained
10	38 6/7	3500	77	18 hrs	No	Unexplained
11	39 0/7	4000	98	1 day	No	Cord
12	28 0/7	510	<1	1 day	No	IUGR
13	30 0/7	710	<1	14 days	No	IUGR
14	39 4/7	3284	43	2 days	BPP 2 weeks prior	Cord
15	30 2/7	850	<1	3 days	No	IUGR/PIH
16	37 6/7	3080	58	12 hrs	No	Abruption

NST Non-Stress test: BPP biophysical Profile: PIH Pregnancy Induced Hypertension, IUGR Intrauterine Growth Restriction with no other cause of death found: DFM Decreased Fetal movement.

Results: We found that 50% of mothers had waited 2 days or greater before seeking care for DFM and 44% of the stillbirths were severely growth restricted. We also found that antenatal testing in 3 cases were falsely reassuring. In case 1 the provider did not appreciate growth restriction, in case 2 the patient was post dates and elected expectant management in the setting of decreased fetal movement and reassuring testing. In case 9, the patient had had a previous stillbirth and reported persistent DFM

Conclusions: Educating providers and women about the importance of fetal movement is one strategy to reduce these deaths, increased vigilance to detect IUGR is a second strategy. Also a history of persistent DFM at term, one might consider induction even if antenatal testing is reassuring.

P47 - Trends in hospital-based surveillance of stillbirths with malformations (1986-2005)

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Background: A surveillance program can provide information about the type, frequency and occurrence of malformations in a defined population of births. Though most programs are population-based and ascertain only live births in state-based registries, the hospital-based Active Malformation Surveillance Program at the Brigham and Women's Hospital (BWH) includes both stillbirths and elective terminations (Eabs).

Objective: To examine trends in stillbirths and Eabs associated with malformations, and possible correlates ascertained at a large American urban teaching hospital.

Methods: Through the Active Malformation Surveillance Program, we identified all births (livebirths, stillbirths, Eabs) in a 20 year period at the BWH. Miscarriages were not included.

Results:

Year	Births, Malfs+ NoMalfs	LB, Malfs+ NoMalfs	Stillbirths Malfs+ NoMalfs	Eabs Malfs+ NoMalfs	LBs Malfs	SB Malfs	Eab Malfs
1986-1990	61,054	50,707 83.0%	347 .6%	10,000 16.4%	NA	NA	NA
1991-1995	54,743	44,443 81.2%	300 .5%	10,000 18.2%	1324 2.4%	34 .06%	1040 1.9%
1996-2000	57,814	47,539 82.2%	275 .5%	10,000 17.2%	1484 2.6%	1 .001%	842 1.4%
2001-2005	47,763	46,893 98.2%	384 .8%	486 1.0%	1288 2.7%	19 .04%	32 .07%

After January 1, 2001, the practice of a specific abortion provider relocated from the BWH to private practice. Following 2001, the frequency of eabs decreased and the frequency of stillbirths increased. The autopsy rate was less than 47% during the years 2003-2005

Conclusion: Ascertaining the frequency of stillbirths is a challenge, even with the skills of a well-established hospital-based active malformation surveillance program. Prevalence rates may be influenced by the definition of stillbirth, autopsy rate, and as we hypothesize, the relationship to abortion services. The BWH data for the frequency of malformations cannot be used to approximate population-based figures since these include both mothers who had planned to deliver at the BWH (non-transfers) and those prenatal care was transferred after the detection of fetal malformation (transfers). Additional studies are needed to refine that distinction, to determine if the findings of one hospital reflect the experience at other institutions, and whether the trend attributed to the provision of abortion services persists over time.

P48 - Stillbirth versus SIDS: anatomic samples preservation and genetic research

Valentina Casale, Roberta Oneda, Luigi Matturri

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This project comes under the indications provided by Law n.31 of February 2nd 2006 "Regulation for Diagnostic Post Mortem Investigation in Victims of Sudden Infant Death Syndrome (SIDS) and unexpected fetal death, that stipulates the development of research programmes aimed at reducing unexpected fetal death and Sudden Infant Death Syndrome rates, that are currently a major socio-medical problem.

No in-depth investigations regarding the genetic bases of these pathologies, their incidence and the damaging effect of risk factors are yet present in the literature.

Recent knowledge in the field of molecular genetics suggests a possible involvement of specific genes in the pathogenesis of these syndromes, particularly of SIDS, and the importance of interactions between the genetic constitution and environmental factors in unleashing the fatal effects.

The major obstacle to genetic research is the complex characteristics of the human anatomic samples available. In fact, autoptic biopsies are performed 24 h post-mortem and are usually formalin-fixed. This common fixation procedure, although it is a traditional method of tissue preservation for histopathological examination, compromises the quality and integrity of nucleic acids (DNA and RNA). To solve this problem, in this Institute a novel and innovative buffer, called RNAlater, has been introduced to preserve the nucleic acids: samples treated with this buffer have comparable quality to fresh frozen tissue samples. In this way it is possible to store samples at -20°C indefinitely, without significantly affecting the amount or the integrity of the recoverable nucleic acids.

The main purpose of our study is to expand on molecular genetic research, in order to identify the involvement of specific genes in these syndromes.

In recent studies allelic variations in the promoter region of serotonin transporter (5-HTT) gene have been shown as a novel risk factor for SIDS in American and Japanese cases (Weese-Mayer DE et al. 2003). This gene, located on human chromosome 17q11.2, encodes for a membrane protein that regulates the uptake of serotonin, a neurotransmitter with important roles during embryogenesis and autonomic nervous system differentiation.

The long "L" allele increases effectiveness of the promoter and would lead to reduced serotonin concentrations at nerve endings compared with the short "S" allele.

A new screening protocol of Italian SIDS cases for the 5-HTT gene has been undertaken in our laboratory. The analysis has been extended to SIUD cases and to related controls. The results of the molecular genetic analyses are flanked by macro- and microscopic examinations of other organs and in particular by histological tests on serial sections of the major brainstem nuclei, in order to correlate morpho-functional lesions of the autonomic nervous system with any genetic alterations identified.

P49 - Cardiovascular causes of perinatal loss

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High risk changes in the cardiac action, mostly manifesting with arrhythmias, may be caused by microscopic malformation of the conduction system. The finding of accessory AV communications, particularly nodo-fasciculoventricular Mahaim bundles are rather frequent in perinatal loss as well as in SIDS, but a clinicopathological assessment of their lethal arrhythmogenic potential is often impossible. These congenital abnormalities, under particular conditions and/or neurovegetative stimuli, are liable to provoke electrical inhomogeneity, instability, and desynchronization with impeding risk of malignant junctional arrhythmias. Mahaim fibers have been detected in 39% of sudden perinatal death and in 23% of SIDS victims. These lesions have been attributed to the variable outcome of a "resorptive degeneration" process that normally "reshapes" the junctional pathways in the early postnatal period. Another approach to the same problem can be made by taking into consideration the persistence of ontogenically specialized ring tissue, astride the AV annuli or, as seen in neonatal death victims, putting together a sort of "arrhythmogenic interface" with the ordinary myocardium, at the top of the ventricular septum. Also, the central cardiac structure supporting the conduction system, could possibly interfere with the causation of impulses, as in the cases of cartilaginous metaplasia of the fibrous body, detected in 6% of SIDS and in 19% of sudden perinatal victims. Regarding the long QT syndrome, as a favoring condition for ventricular tachycardia-fibrillation with a high risk of sudden cardiac death, one can say that this thesis is losing ground; the implications of the neurovegetative reflex mechanisms, does not correspond to any clear-cut pathologic changes. Early atherosclerotic lesions of the cerebral and coronary arteries, involving also the sino-atrial and atrio-ventricular arteries, significantly associated with maternal cigarette smoking, are common in the perinatal period. Lastly, cases of fibromuscolar hyperplasia of the pulmonary artery were detected.

P50 - More placenta-bed pathology in obese women with intra-uterine fetal death

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Introduction: Prevalence of maternal obesity is increasing steadily worldwide and obesity is a known risk factor for adverse outcome of pregnancy. Distribution of causes of death in women with obesity is unknown. Recent studies in the Netherlands indicated that women in the age group 20-39 years had the highest body-mass index (BMI) increase over the last years. Effect on pregnancy outcome was unknown for the Dutch population.

Methods: In a Dutch multi-centre study on intra-uterine fetal death (IUFD), during a 5 year period (2002-2007) we studied 750 singleton deaths > 20 weeks of gestation for which the diagnosis of IUFD was determined before labour. We classified BMI according to the WHO, < 18.5; 18.5-24.9; 25.0-29.9 and ≥ 30.0. The reference group consisted of age and sex matched women in the general Dutch population.

Results: Prevalence of women in our study with a BMI ≥ 30.0 (20.7%) was more than twice as high as in the reference group (9.8%; 95% CI 17.4-24.2, p<0.001). Women with a BMI ≥ 30.0 had significantly more hypertension (risk difference 16%, 95% CI 6.9-25.4; p<0.001) and diabetes related disease (risk difference 8%, 95% CI 2.0-13.6; p=0.003) during pregnancy and more IUFD's with a placental cause of death (risk difference 10%, 95% CI 1.1-19.3; p=0.04), than women in the other BMI groups. In the placental cause of death group, women with a BMI ≥ 30.0 had more IUFD's with placental bed pathology than in the group with a normal BMI (risk difference 11%, 95% CI 0.04-21.2; p=0.04).

Conclusion: Women with a BMI ≥ 30.0 have a higher risk of IUFD, their pregnancies are associated with more hypertension and diabetes related disease resulting in more IUFD's with a placental cause of death, namely placenta-bed pathology. For these obese women preconceptual advice, risk analysis and accurate identification of pregnancy complications are needed.

P51 - A placental cause of intra-uterine fetal death depends on the perinatal mortality classification system used

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Introduction: Different classification systems for the cause of intra-uterine fetal death (IUFD) are used internationally. About two thirds of these deaths are reported as unexplained and placental causes are less well defined. Differences between systems could have consequences for the validity of vital statistics, for targeting preventive strategies and for counselling parents on recurrence risks. Our objective was to compare use of the Tulip classification with other currently used classification systems for causes of IUFD.

Methods: We selected the Extended Wigglesworth classification, Modified Aberdeen and the classifications by Hey, Hovatta, Galan-Roosen and Morrison. We also selected the ReCoDe system for relevant conditions, comparable to contributing factors in the Tulip classification. Panel classification for 485 IUFD cases in the different systems was performed by assessors after individual investigation of structured patient information.

Results: Distribution of cases into cause of death groups and relevant conditions for the different systems varied, most of all for the placental and unknown groups. Largest cause of death group was placental pathology in four of the seven systems we used, (range: 44.5-64.3%). The other three systems, Extended Wigglesworth, Modified Aberdeen and the classification by Hey did not have placental causes. Cause was unknown in 0% to 88.7% of deaths. Many systems consider clinical conditions as cause of death. Largest relevant condition was growth restriction.

Conclusion: Our findings illustrate the vital role of the placenta in determination of optimal fetal development. Classification systems preferably address mother, fetus and placenta together; have a placental cause of death group with subcategories; a low percentage of cases with an unknown cause of death and no death groups consisting of clinical manifestations. A useful classification aids future research into placental causes of IUFD.

P52 - Success rates of post-mortem tissue cultures in IUFD

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Introduction: Cause of death is unexplained in about two thirds of the stillbirth group, consisting of intra uterine fetal deaths (IUFD) and intrapartum deaths. Aneuploidy is an important cause of death. However, uniform evidence based stillbirth protocols for chromosomal analyses are not available and results of tissue cultures are often disappointing. Our objective was to determine success rates of tissue cultures in IUFD.

Methods: In a Dutch multi-centre study on IUFD, during a 5 year period (2002-2007), we studied 750 singleton deaths > 20 weeks of gestation for which the diagnosis of IUFD was determined before labour. Tissue cultures for chromosomal analysis were performed for 453 IUFD's.

Results:

Year	CVB*	amniotic fluid	umb cord	fetal blood	FLB#	pericard	cartilage	tissue other	tissue** various	STT$ + invasive	TOTAL
n	2	75	193	9	43	3	33	26	55	14	453
Successful	2	63	62	2	12	0	8	5	14	12	180
%	100	84.0	32.1	22.2	29.9	0	24.2	19.2	25.4	85.7	39.7

*chorion villus biopsy (CVB), #fascia lata biopsy (FLB), **tissue various = multiple tissues, $solid tissue testing (STT)

Tissue cultures were successful in 180 (39.7%) deaths. Highest culture success rates were for CVB, amniotic fluid and for IUFD's for which STT was performed in combination with invasive prenatal sampling. Cultures for these groups were more successful than post-mortem non-invasive tissue sampling ($p < 0.001$). Culture success rates of post-mo-rtem non-invasive tissue sampling varied between 0% for pericard and 32.1% for umbilical cord. After exclusion of pericard in this group, umbilical cord was not cultured successfully more often than fetal blood and tissue type other (p=0.17).

Conclusion: Invasive prenatal tissue sampling in IUFD is recommended for chromosomal analysis. If this is not feasible due to objection of parents, inexperience and/or diminished amniotic fluid or logistic problems tissue sampling of umbilical cord seems to have the highest culture success rate and is less mutilating.

P53 - Establishment of morphological abnormalities after fetal death by the physician is not a sensitive selection criterion for chromosomal analysis

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Introduction: Cause of death is unexplained in about two thirds of the stillbirth group, consisting of intra uterine fetal deaths (IUFD) and intrapartum deaths. Aneuploidy is an important cause of death. Uniform evidence based stillbirth protocols for chromosomal analyses are not available. Some studies advise chromosomal analyses in a selected population due to substantial costs. One of the selection criteria is morphological abnormalities present at birth. Our objective was to determine the value of evaluation of morphological abnormalities at birth by the physician attending the delivery for an IUFD cohort.

Methods: In a Dutch multi-centre study on IUFD, during a 5 year period (2002-2007) we studied 750 singleton deaths > 20 weeks of gestation for which the diagnosis of IUFD was determined before labour. Morphological abnormalities of the fetus determined by the trainee or gynaecologist at birth were all classified by a perinatal geneticist according to the phenotypic abnormality classification by Merks et al1.

Results: Tissue cultures were performed for 508 (67.7%) IUFD's, in 246 cases (48.4%) a karyotype was obtained. An abnormal karyotype was observed in 32 (13.0%) deaths. Of the 246 karyotypes 180 were determined post-mortem. In six of 25 IUFD's (24.0%) with an abnormal karyotype established post-mortem no morphological abnormalities were seen at birth whereas in the group with a normal karyotype (n=155) established post-mortem, morphological abnormalities were observed in 31 IUFD's (20.0%). Overall, in 139 out of 180 cases (77%) morphology matched with the karyotype, resulting in only a marginal strength of agreement, with a kappa of 0.36 (95% CI 0.21-0.51).

Conclusion: Establishment of morphological abnormalities after fetal death by the physician attending the delivery of an IUFD is not a sensitive selection criterion for performance of chromosomal analysis.

P54 - Factor v leiden or prothrombin g20210a mutation in 750 women with IUFD

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Introduction: The risk of venous thromboembolism in women with a thrombophilic defect is increased during pregnancy as this is an acquired hypercoagulable state. Growing evidence suggests that these women may be at higher risk of fetal loss, due to placental insufficiency as a result of placental infarction. However due to methodological limitations, results on the presence and magnitude of associations between thrombophilic defects and fetal loss are inconsistent. Our objective was to investigate the relation between Factor V Leiden or prothrombin G20210A and intra-uterine fetal death (IUFD).

Methods: In a Dutch multi-centre study on IUFD, during a 5 year period (2002-2007) we studied 750 singleton deaths > 20 weeks of gestation for which the diagnosis of IUFD was determined before labour. Factor V Leiden and prothrombin G20210A were tested at induction of labour. Standard tests (PCR) for all women were performed in one laboratory. We compared prevalence of thrombophilic defects to reference values from the literature.

Results: Of the 689 women tested for factor V Leiden, 50 (7.3%) were carrier versus 639 (92.7%) non-carriers. In the normal population 5% is carrier of factor V Leiden (p=0.007). Of the 691 women tested for prothrombin G20210A, 26 (3.8%) women were carrier and 665 (96.2%) non-carrier. In the normal population 3% is carrier of prothrombin G20210A mutation (p=0.240).

Conclusion: In our large IUFD group the prevalence of female factor V Leiden carriers was significantly higher than in the normal population and a comparable prevalence of female carriers of prothrombin G20210A mutation was established.

P55 - Thrombophilia in 750 male partners of women with IUFD

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Introduction: Growing evidence suggests that women with thrombophilic defects may be at higher risk of fetal loss. Although some paternal components to the predisposition of preeclampsia have been demonstrated it is not known whether paternal components contribute to intra uterine fetal death (IUFD). Our objective was to investigate the relation between paternal thrombophilic defects and IUFD.

Methods: In a Dutch multi-centre study on IUFD, from 2002-2007 we studied 750 singleton deaths > 20 weeks of gestation for which the diagnosis of IUFD was determined before labour. We tested male partners of women with IUFD for antithrombin (AT), Protein C, Protein S type I and III, factor V Leiden, prothrombin G20210A (factor II) and factor VIII: Ag. Standard tests were performed one laboratory. Normal ranges were determined in healthy male blood donors. We compared prevalence of thrombophilic defects to reference values from the literature.

Results: Of the 642 men tested for factor V Leiden, 24 (3.7%) were carrier versus 618 (96.3%) non-carriers. Prevalence of factor V Leiden in the normal population is 5% (p=0.14). 642 men were tested for prothrombin G20210A, 10 (1.6%) were carriers and 632 (98.4%) non-carriers. Prevalence of prothrombin G20210A mutation in the normal population is 3% (p=0.03).

Table 1 Abnormal levels of thrombophilic tests in male partners of women with IUFD compared to the reference population

	AT	Protein C	PS type I	PS type III	factor VIII-ag
tested, n	655	661	659	656	659
normal levels, n	653	657	655	616	579
%	99.7	99.4	99.4	93.9	87.9
abnormal levels	▼	▼	▼	▼	▼
abnormal levels, n	2	4	4	40	80
%	0.3	0.6	0.6	6.1	12.1
reference,%	0.05	0.2	0.1	0.1	2.5
p	0.004	0.02	< 0.0001	< 0.0001	<0.0001

Conclusion: In our IUFD group the prevalence of male factor V Leiden carriers was comparable to the normal population, prevalence of prothrombin G20210A mutation was higher. Decreased levels of antithrombin, Protein C, Protein S type I and III and increased levels of factor VIII: Ag were observed significantly more often in male partners of women with IUFD compared to the normal population.

P56 - Women with factor v leiden or prothrombin g20210a mutation do not have more intra uterine fetal deaths with maternal or fetal placental circulation disorders

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Introduction: Women with thrombophilia are at higher risk of VTE during pregnancy due to the acquired hypercoagulable state. It is likely that not only maternal veins but also placental vessels are more prone to the development of thrombosis. Our objective was to compare maternal and fetal placental circulation disorders in women with intra-uterine fetal death (IUFD) and thrombophilia and women without thrombophilia.

Methods: In a Dutch multi-centre study on IUFD, during the period 2002-2007 we studied 750 singleton deaths > 20 weeks of gestation for which the diagnosis of IUFD was determined before labour. Factor V Leiden and prothrombin G20210A were tested at induction of labour. Panel classification of cause according to the Tulip classification was performed by assessors after individual investigation of structured patient information. We studied the cause of death group "maternal and fetal placental circulation disorders": placenta bed pathology with abruption or infarction as origin of mechanism and placental parenchyma pathology with fetal thrombotic vasculopathy and massive perivillous fibrin deposition as origin of mechanism.

Results: Of the 689 women tested for factor V Leiden, 50 (7.3%) were carriers. Of the 264 deaths caused by "maternal and fetal placental circulation disorders" 20 (7.6%) mothers were carriers of factor V Leiden. Of the 425 deaths with another cause of death 30 (7.1%) mothers were carriers of factor V Leiden (p=0.88). Of the 691 women tested for prothrombin G20210A, 26 (3.8%) were carriers. Of the 265 deaths caused by "maternal and fetal placental circulation disorders" 11 (4.2%) mothers were carriers of prothrombin G20210A mutation. Of the 426 deaths with another cause of death 15 (3.5%) mothers were carrier of prothrombin G20210A mutation (p=0.68).

Conclusion: In women with IUFD and factor V Leiden or prothrombin G20210A mutation "maternal and fetal placental circulation disorders" did not seem to cause IUFD more often than in non-carriers.

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Evaluation Form

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Tuesday 2nd October 2007

Please indicate your evaluation of each session by circling the appropriate score

Score range: 1 poor 2 average 3 good 4 excellent

JOINT PLENARY

Content:	1 2 3 4	*Comments/Highlight(s)*
Relevance/Value:	1 2 3 4	

ROUNDTABLE ON PREVENTION

Content:	1 2 3 4	*Comments/Highlight(s)*
Relevance/Value:	1 2 3 4	

WORKSHOP: CLASSIFICATION I

Content:	1 2 3 4	*Comments/Highlight(s)*
Relevance/Value:	1 2 3 4	

WORKSHOP: CLASSIFICATION II

Content:	1 2 3 4	*Comments/Highlight(s)*
Relevance/Value:	1 2 3 4	

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Conference Management

Please indicate your evaluation by circling the appropriate score

Score range: 1 poor 2 average 3 good 4 excellent

Pre-conference admin arrangements
1 2 3 4

Conference organisation on site
1 2 3 4

Venue/accommodation
1 2 3 4

Catering
1 2 3 4

Comments

Conference Feedback

1. Overall impression/comments

2. What actions do you plan to take as a result of this conference?

3. How would you like to see the conference develop in the future?

Thank you for taking time to complete this form.
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