

Deaths Due to Anaesthesia

CEMACH 2003-2005

Deaths Due to Anaesthesia

The latest CEMACH report on Why Mothers Die 2003-2005 was recently released. The BJA printed an editorial and review article in the January 2008 edition, in addition it has been discussed in numerous television and newspaper reports. The subject is therefore topical and could easily appear in a future FRCA exam.

Confidential Enquiry into Maternal and Child Health



Saving Mothers' Lives:

Reviewing maternal deaths to make motherhood safer - 2003-2005



December 2007

The Seventh Report of the Confidential Enquiries
into Maternal Deaths in the United Kingdom

Example of possible future FRCA Final SAQ question:

- What does CEMACH stand for and briefly describe its history? (20%)
- What were the causes of direct death due to anaesthesia? (50%)
- What recommendations were made to improve patient safety? (30%)

The Confidential Enquiry into Maternal and Child Health, started work in April 2003.

CEMACH Publications

Saving Mothers Lives – Reviewing maternal deaths to make motherhood safer - 2003 – 2005 is the latest Confidential enquiry into causes of death during the peripartum period. The first triennial report of the Confidential Enquiry into Maternal Deaths (CEMD) was published in 1952, making it the longest running Confidential Enquiry.

From 1 April 2005 the National patient Safety Agency took over responsibility for funding and commissioning the work of the National Confidential Enquiries from the National Institute of Clinical Excellence (NICE). On 1 April 2005, NICE joined with the Health Development Agency to become the new National Institute for Health and Clinical Excellence.

CEMACH is a self governing body managed by its own board with members nominated by eight Royal Colleges

- Royal College of Obstetricians & Gynaecologists (RCOG)
- Royal College of Midwives (RCM)
- Royal College of Paediatrics & Child Health (RCPCH)
- Royal College of Pathologists (RCPATH)
- Royal College of Anaesthetists (RCA)
- Royal College of General Practitioners
- Royal College of Psychiatrists
- Faculty of Public Health (FPH)

In the most recent report there were six direct deaths due to anaesthesia. This is a similar number to the 2000-2002 report. In addition there were 31 cases where poor perioperative management may have contributed to death.

The causes of death varied in comparison to the last report, 3 of the deaths were attributed to general anaesthesia, 1 was related to regional anaesthesia, 1 was related to a procedure performed by an anaesthetist and the last death had no obvious cause. By comparison in the last report, all deaths were related to the administration of general anaesthesia.

Direct deaths due to anaesthesia

The ladies who died as a direct result of an anaesthetic ranged in age from 23-33 years, 4 of these ladies were obese, 2 morbidly so. 2 of the ladies died under the care of the gynaecological services in early pregnancy.

- Postoperative Respiratory Failure

3 ladies died due to postoperative respiratory failure.

Case 1 was an obese asthmatic lady who died as a result of failure to re-intubate in recovery after having undergone a laparoscopy for an ectopic pregnancy. Post-extubation the lady developed severe bronchospasm leading to acute respiratory distress. A senior anaesthetist was called, however, by the time they arrived an irreversible cardiac arrest had occurred.

Case 2 was an obese lady who received an anaesthetic during her early pregnancy. She was given a second large dose of fentanyl prior to extubation. The lady was transferred to recovery and left with a recovery nurse. Within 5 minutes the lady developed respiratory distress and the trainee anaesthetist was called back to the recovery, having already left the unit. Nursing staff immediately tried to support the breathing, however, attempts were inadequate. The lady became bradycardic and suffered a fatal cardiac arrest. It was concluded that the trainee did not appreciate the profound ventilatory effect of the opioid.

Case 3 was a morbidly obese lady who had an elective LSCS under spinal anaesthetic performed by a Consultant Anaesthetist. Post-operatively the lady became short of breath and agitated. Despite this she was sent to the postnatal ward a few hours later. She received oxygen but remained agitated and short of breath. An anaesthetist was asked to review the lady. The lady suffered a fatal cardiac arrest a few hours later, attempts at resuscitation were confounded by a lack of readily available resuscitation equipment.

Drug administration error

A lady of slight build had an epidural for labour and had a forceps delivery. She suffered a postpartum haemorrhage and syntocinon and IV fluids were commenced. Shortly afterwards the lady had a grand mal convulsion followed by a VF arrest. 150ml of 0.1% bupivacaine were administered intravenously and post arrest levels were 2.1 and 4.2mg/l.

Anatomical compromise

A lady with pectus excavatum presented in mid-pregnancy with reduced fetal movements and fulminant PET and HELLP. She was treated with oral labetalol, magnesium sulphate and hydralazine. Urgent LSCS was indicated and it was agreed that an arterial line and central venous catheter should be inserted prior to surgery. RIJ cannulation was unsuccessful and a Consultant Anaesthetist cannulated the subclavian vein on second attempt. Shortly after the insertion of the CVP line the lady suffered a cardiac arrest, this was unretrievable. The autopsy revealed a large right haemothorax.

Unascertained cause

An obese lady with longstanding renal disease necessitating a nephrectomy subsequently became pregnant and had a premature labour and delivery. A few weeks postpartum she developed loin pain, fever and an ileofemoral vein thrombosis. A septic focus was found in her remaining kidney and the lady requested a general anaesthetic for drainage of this focus.

During the procedure she suffered a fatal cardiac arrest. A cause of death was not found, it was thought to be secondary to an arrhythmia

Recommendations from the Direct Deaths

Post-operative respiratory failure – all women, including those in early pregnancy should receive the same high standard of care, this should extend into the early post-operative phase. Recovery staff should have immediate back-up from the anaesthetist until the patient is fully conscious and has stable vital signs. In the first 2 cases immediate senior back up may have contributed to the fatal outcomes and the trainee anaesthetist should be able to gain prompt senior backup. In the last case of post-operative respiratory failure, the lady received inadequate investigation and treatment, thus if an anaesthetist is unsure of cause of such symptoms advice should be sought.

Drug administration error – Strategies to avoid such errors have been described by the NPSA. In addition, there are a number of case reports relating to the use of 'lipid rescue' in patients with local anaesthetic toxicity.

Anatomical compromise – It was felt that the problems associated with CVP insertion were related to the ladies abnormal anatomy and that USS guidance would not have negated this problem.

Deaths Where Anaesthesia Contributed

There were 31 deaths identified in which anaesthetic/ peri-operative care contributed to death.

These were broadly categorised under the following headings;

○ Poor management of haemorrhage/sepsis/ pre-eclampsia and eclampsia

Haemorrhage – 14 ladies died from haemorrhage and 3 ladies died from genital tract trauma. 10 of these ladies received suboptimal care and there was an apparent inability to recognise the classical signs of bleeding. Of these 10 ladies there was poor treatment of uterine atony and management of placenta percreta. 2 of the ladies received little or no antenatal care. 2 ladies declined the use of blood products (both these ladies received a high standard of care).

Sepsis – Of the ladies who died from sepsis poor anaesthetic or resuscitation management were thought to have contributed to 10 deaths. Again lack of recognition of the classical signs of sepsis by trainee's was frequent. When cardiac arrest did occur the lack of available resuscitation equipment and suction contributed to failure of resuscitation attempts.

Pre-eclampsia/eclampsia – 4 ladies who died from pre-eclampsia/eclampsia were felt to have poor anaesthetic management. In all the cases the systolic blood pressure remained high at the time of the caesarean section or in the postoperative period. The importance of blunting the sympathetic response to laryngoscopy should be remembered. Care of these ladies should include Consultant input and use of invasive monitoring should be considered.

○ Failure to recognise serious illness

Almost every chapter within the report highlighted this problem. This problem is confounded by the rarity of such events combined with the normal changes in physiology during pregnancy

and childbirth.

Management of the obese parturient

Obesity requires a multi-disciplinary approach to care during the pregnancy and peripartum period. The anaesthetist should be involved in care from the antenatal period and evidence based guidelines should be produced.

Quality of in-house Trust enquiries into serious untoward incidents including maternal deaths This is the first triennial report where a substantial number of reports from in-house enquiries related to deaths have been included in the report. The quality of these reports varies markedly, some of which lacking insight into the clinical problem and being undertaken by clinicians who are not directly involved in the maternity services. Other reports may have been subject to bias as the investigatory panel were directly involved with the clinical cases being investigated.

In young fit woman the severity of haemorrhage may not be recognised until the cardiovascular system decompensates suddenly. Obstetric haemorrhage is often abrupt, massive and may be accompanied by a coagulopathy.

Key Recommendations

This triennial report saw the introduction of the top ten key recommendations;

- 1. Pre-conception care – Pre-conception counselling and support, both opportunistic and planned, should be provided for women of child-bearing age with pre-existing serious medical or mental health conditions which may be aggravated by pregnancy. This includes obesity. This recommendation especially applies to women prior to having assisted reproduction or other fertility treatments.**
- 2. Access to care – Maternity service providers should ensure that antenatal services are accessible and welcoming to all women. Women should have had their first full booking visit and hand held maternity records completed by 12 completed weeks of pregnancy**
- 3. Access to care- Pregnant women, who, on referral to maternity services, are already more than 12 weeks pregnant should be seen within 2 weeks of referral**
- 4. Migrant women – Women who may not have had previous contact with our health service should have a full medical history and examination at booking or as soon as possible afterwards. This should be performed by an adequately trained doctor. Women who come from countries where female genital mutation is prevalent should have a management plan for labour.**
- 5. Systemic hypertension requires treatment – All women with a systolic blood pressure of greater than 160mmHg should be treated.**
- 6. Caesarean section – Whilst for some mothers and/or their babies caesarean section may be the safest mode of delivery, mothers should be advised that caesarean section is not a risk-free procedure and could cause problems in the current and subsequent pregnancies Women who have had previous caesarean section should have placental localisation in their current pregnancy to exclude placenta praevia, and if present, to enable further investigation to try to identify placenta accreta and the development of safe management strategies.**
- 7. Clinical skills – Maternity services should ensure that all clinical staff involved in the care of women should learn from any critical and untoward incidents occurring within their Trust.**
- 8. Staff training – All clinical staff must undertake regular, written and documented and**

audited training in identification, initial management and referral for serious medical and mental health problems; early recognition of severely ill pregnant women and should receive training in basic, intermediate and advanced life support.

9. Early warning system – There is an urgent need for the use of an early warning system specifically designed for obstetric ladies that will account for changes in their physiology and enable early recognition of the sick lady.

10. National guidelines- These are urgently required for the management of the obese pregnant woman, sepsis in pregnancy and for pain and bleeding inn early pregnancy. Maternal death is a tragedy not only for the family, but for all the personnel involved and the anaesthetist commonly assumes full responsibility.

References

[i] [Saving Mothers' Lives. Triennial report 2003-2005](#)

[ii] Anaesthesia chapter from Saving Mothers' Lives; reviewing maternal deaths to make pregnancy safe. [Br. J. Anaesth. 2007 100: 17-226](#)

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