

Maternal health in pregnancy:

messages from the 2014 UK Confidential Enquiry into Maternal Death

The Confidential Enquiry into Maternal Deaths began in 1952 and has led to major improvements in care for pregnant and postnatal women. In 2012, the responsibility for awarding and monitoring the contract passed to the Healthcare Quality Improvement Partnership (HQIP). The maternal, newborn, and infant enquires were awarded to a collaboration called MBRRACE-UK (Mothers and Babies: Reducing Risk through Audits and Confidential Enquiries). The maternal death enquiry runs from the National Perinatal Epidemiology Unit (NPEU) in Oxford. There have been changes; there are now annual reports, with surveillance of deaths based on 3-year rolling averages and an annual topic-specific serious morbidity and mortality review.

MATERNAL DEATH: DEFINITIONS

A maternal death is defined as a death during pregnancy or up to 42 days postnatal. Deaths are classified as 'direct' — deaths resulting from obstetric complications of the pregnant state; 'indirect' — deaths from a previous existing disease or a disease that develops during pregnancy, or that is aggravated by pregnancy; 'late' — deaths occurring between 42 days and 1 year postnatal that are due to a direct or indirect cause; and coincidental — deaths from unrelated causes that happen in pregnancy or the puerperium. The process of producing the report involves obtaining and anonymising the medical records for each case, including the GP records, and completion of a short report. There has been difficulty obtaining information from GPs, although the General Medical Council states that:

*'All doctors in clinical practice have a duty to participate in clinical audit and to contribute to National Confidential Inquiries.'*¹

GPs have been involved in the review process for the past 10 years. There is now a team of eight GP assessors, working in pairs; each case is assessed twice and conclusions agreed jointly. The case is also reviewed by an appropriate range of specialists. Finally, a multidisciplinary chapter writing meeting is convened to look at the case reviews and draw out and develop themes.

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REDUCING DIRECT CAUSES OF MATERNAL MORTALITY

The first new format report was produced in December 2014 and covered deaths from 2009–2012.² Maternal mortality had fallen to 10/100 000, mainly as a result of a reduction in direct deaths. The major cause of 'direct' deaths was thromboembolism. Two-thirds of the deaths were due to 'indirect causes', and worryingly this rate has not changed in recent reports. The major causes of indirect deaths were cardiac, infections, medical problems, and suicide. Psychiatric causes of death will be covered in the 2015 report and cardiac causes in the 2016 report.

It is clear that pregnancy for some women is 'risky'. Of the women who died, 74% had pre-existing medical conditions, including 15% with asthma and 17% with mental health problems; 22% were obese and 27% were overweight. Maternal mortality is higher among older women and women living in the most deprived areas. Black African and Asian women, especially if they are born outside the UK, are more likely to die. Around one-quarter of the women who died smoked and 8% were known to be substance users. Only 29% of those who died had the recommended level of antenatal care (some died before a normal booking date and 1 in 10 received no care at all).

Sepsis was chosen as the topic for the mortality and severe morbidity review following a significant increase in deaths from genital tract sepsis reported in the previous report (2006–2008).³ In all, 83 women died from sepsis between 2009 and 2012, but only one-quarter of women died from genital tract sepsis. The time period of this Enquiry covered the H1N1 influenza pandemic from which 36 women died. Sadly, more than 50% of these women died after H1N1 influenza immunisation became available, so their deaths were potentially preventable. Although neuraminidase inhibitors (NAIs) may provide little benefit for the general adult population,⁴ observational data on pregnant women with pandemic

influenza show significant benefit if they are treated early with antiviral agents.⁵ The major recommendation for GPs is that flu immunisation of pregnant women is hugely important (Box 1). If a woman develops flu or has close contact with someone with a flu-like illness she should be treated with NAIs as early as possible.

Sepsis is defined as the presence of an infection along with the manifestations of a systemic inflammatory response (SIRS). In pregnant or postnatal women it is often caused by Group A Streptococcus which may be genital or non-genital (for example, a sore throat). The women who died or who suffered severe morbidity often presented with vague symptoms and may have seen GP services on several occasions before they were admitted to hospital. For some, the severity of their illness was not recognised until too late and adequate observations were either not taken or not acted on, or both. Fit, healthy women can compensate physiologically until they are 'in extremis'. The Enquiry emphasises the importance of routine observations (pulse, temperature, blood pressure, and respiratory rate), allowing early recognition of women who are potentially septic and emergency hospital admission for IV antibiotics. The UK Sepsis Trust Primary Care Toolkit 2014 has produced guidelines for SIRS screening and evaluation for 'red flag sepsis'.⁶

THE DANGER OF PRE-EXISTING MEDICAL CONDITIONS

Women with pre-existing medical conditions were a particular issue among the indirect deaths reviewed in this Enquiry.

Ten women died from respiratory illness, including three who died from asthma. These three women all smoked, the severity of their asthma was underestimated and there was doubt about their compliance with medication. Pregnancy can have an unpredictable effect upon asthma. The conclusions of a meta-analysis of 14 studies is that during pregnancy about one-third of patients with asthma experience an

Box 1. Key messages for GPs

- All pregnant women should be strongly encouraged to have flu immunisation.
- If a pregnant woman develops flu or has close contact with someone with a flu-like illness she should be treated with neuraminidase inhibitors (NAIs) as early as possible.
- Women who are potentially septic should have routine observations (pulse, temperature, blood pressure, and respiratory rate) to allow early recognition and they should be admitted to hospital as an emergency.
- If the condition of a pregnant woman with epilepsy changes, for example, if she experiences a new fit after a prolonged fit-free interval or an increase in fit frequency or severity, the GP should telephone her neurologist to make an emergency appointment and bypass standard referral systems.
- Proteinuria in early pregnancy should be quantified and investigated if found to be significant.
- All women with pre-existing medical conditions need pre-pregnancy counselling.

improvement, one-third experience a worsening of symptoms, and one third remain the same.⁷ The SIGN guidelines have clear recommendations for pregnant women with asthma;⁸ women with moderate-severe asthma should keep their asthma well controlled, drug therapy for asthma should be the same as for non-pregnant patients, and smokers should be given appropriate support to stop smoking.

There were 14 deaths from epilepsy, including 12 from sudden unexpected death in epilepsy (SUDEP). Of these, 10 deaths were considered preventable. The maternal death rate from epilepsy is now higher than the maternal death rate from hypertensive disorders of pregnancy such as pre-eclampsia. Only two women had received any pre-conception care. In seven women, (50%), there were delays in referral that contributed to their deaths, partly because the GPs did not recognise the significance of a deterioration in their condition and partly because the neurologists did not prioritise these patients for urgent assessment. In this situation the recommendation is that the GP should phone the neurologist and not rely on standard referral mechanisms. There are recommendations to make more use of epileptic-specialist nurses to educate women about first aid measures, advise about modifiable risk factors, such as not to sleep or bathe alone, and to reinforce the importance of taking their anti-epileptic drugs.

There were six deaths from connective tissue diseases. Heavy proteinuria in early pregnancy was sometimes inaccurately attributed to infection and underlying

renal disease was overlooked with serious implications for the pregnancy and long-term health of the mother. The recommendation is that proteinuria in pregnancy should be quantified and investigated if found to be significant (Box 1).

There were common threads for women with pre-existing medical conditions; such women require pre-pregnancy counselling about the effect their illness is likely to have on the pregnancy outcome and the risks of their medication to themselves and the fetus. The GP is unlikely to have this level of knowledge, except with asthma. In asthma and epilepsy, women need reassurance that it is generally safer to continue their medication than to stop when they discover they are pregnant. During pregnancy, the care needs of these women require coordination through a multidisciplinary team, including physicians with a specialist knowledge of their condition in pregnancy. Postnatally, GPs will generally be responsible for ongoing care and a postnatal examination at 6–8 weeks. The specialist needs to be clear what monitoring and follow-up is expected of the GP.

Whenever a maternal death happens it is a tragedy for the family, especially if it could have been avoided with better care. It is likely to be a 'once in a career' experience for a GP and learning from these tragedies is vital for every health professional, GPs included. There are significant messages for GPs in the latest report about the importance of flu jabs for pregnant women, the importance of observations and rapid action in sepsis, and the significance of pre-existing medical conditions.

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Provenance

Commissioned; externally peer reviewed.

DOI: 10.3399/bjgp15X686377

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