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Preventing stillbirths through improved antenatal recognition of pregnancies at risk due to fetal growth restriction☆

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ABSTRACT

Most stillbirths used to be categorized as 'unexplained' and were considered, by implication, unavoidable. Recent evidence indicates that they represent a combined challenge for public health and for clinical services. Independent case reviews have found that many deaths are associated with a failure to recognize risk factors and to afford them the appropriate standard of care. The majority of normally formed fetal deaths had preceding, unrecognized intrauterine growth failure. Improved training and adoption of standardized protocols has led to increased antenatal detection of fetal growth restriction, and this in turn has resulted in significant reductions in stillbirths in areas with high uptake of the training programme. A comprehensive, evidence-based growth assessment protocol (GAP) is currently being rolled out across the NHS to implement this strategy for stillbirth prevention.

Stillbirth: a public health challenge

Stillbirth rates in England and Wales are the highest in Western Europe and have seen little change in the past 20 years.[1,2] Each death is a tragic loss and causes much grief to the parents and extended family. It also affects clinicians and society as a whole. Stillbirths are associated with public health challenges such as maternal obesity, smoking, ethnic factors, and social inequalities.

In the West Midlands, a region with large ethnic minorities and social deprivation, stillbirth rates have been running consistently above the national average.[2] To be able to implement strategies for prevention, we sought to improve our understanding of the causes and associated factors. There were several obstacles to overcome:

1. The traditional Wigglesworth[3] perinatal mortality classification system, in common use over the last two decades, consistently resulted in two thirds of stillbirths being categorized as unexplained, and by implication, unavoidable.[4,5] We developed a new classification (ReCoDe – relevant condition at death)[5] which significantly reduces the

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proportion of deaths considered 'unexplained', and identifies fetal growth restriction (defined as low customized weight-for-gestational age percentile) as the single largest category (Fig. 1). These findings helped to achieve a radical rethink, and suggested that many deaths are in fact *not* unavoidable.

2. Unit-based clinical reviews of perinatal deaths failed to identify the causes of these losses, leaving many cases also 'unexplained'. In large part, this was associated with a lack of standardization of the mortality review. Often this consisted merely of a short discussion after a summary presentation at the departmental perinatal mortality meeting. As a result, there were few processes in place whereby the service could identify system errors and learn from its mistakes.

   The Perinatal Institute ran a series of confidential enquiries with multidisciplinary, independent panels assessing case notes of perinatal deaths in a structured manner, developing paper based and electronic software tools (SCOR – standardised clinical outcome review). These reviews identified that the majority of normally formed stillbirths were potentially avoidable.[6] They also pointed to fetal growth restriction (FGR) as a frequent precursor of intrauterine demise.
3. There was a lack of routinely collected denominator data to ascertain the risk factors in pregnancy which relate to adverse outcome. This was an important deficiency in a maternity population like the West Midlands, with its large areas of social deprivation, migrant populations, high obesity rates and other public health challenges. We implemented the electronic collection of a dataset from all pregnancies delivered in the region's 19 maternity units, using the standardized hand held pregnancy notes as the source for the information. Analysis of the resultant database of over 90,000 pregnancies helped establish risk factors for stillbirth and found that first, after including all known variables such as smoking, obesity, ethnic origin and social deprivation, fetal growth restriction was the single largest population attributable risk; and that second, this risk could be significantly ameliorated by antenatal recognition (Fig. 2).[7]

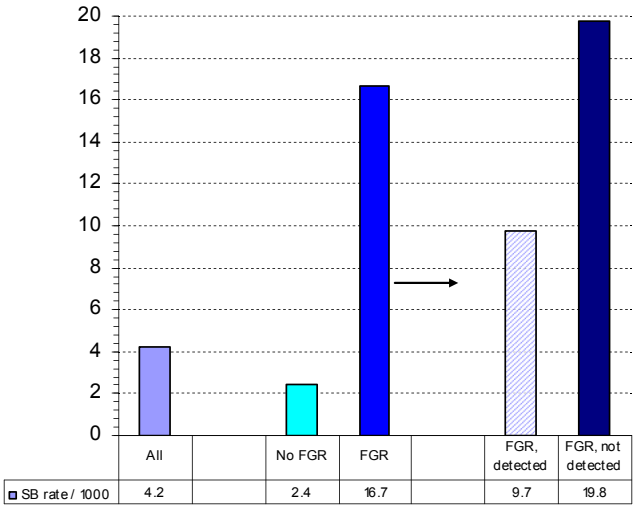

Fig. 2 – Stillbirth rates with and without Fetal Growth Restriction (FGR) and the effect of antenatal detection (Ref. 7).

Fetal growth restriction

This evidence pointed towards FGR as a frequent, avoidable contributor to adverse outcomes. We therefore focussed attention on improving antenatal recognition of FGR to allow appropriate investigations such as ultrasound and Doppler to be undertaken. In systematic reviews, Doppler investigations have been shown to reduce stillbirths[8] as they can identify the fetuses which require timely delivery from an unfavourable intrauterine environment. However, in most pregnancies ending with delivery of a small for gestational age (SGA) baby, the fact that the fetus was SGA (and hence at risk and needing further tests) was not recognized antenatally, with detection rates ranging from 15 to 24% in published studies,[9,10] and 18% in a casenote audit in three Birmingham maternity units.[11]

We therefore implemented a training programme for fetal growth surveillance which included hands on training, risk assessment at the beginning of pregnancy, evidence-based

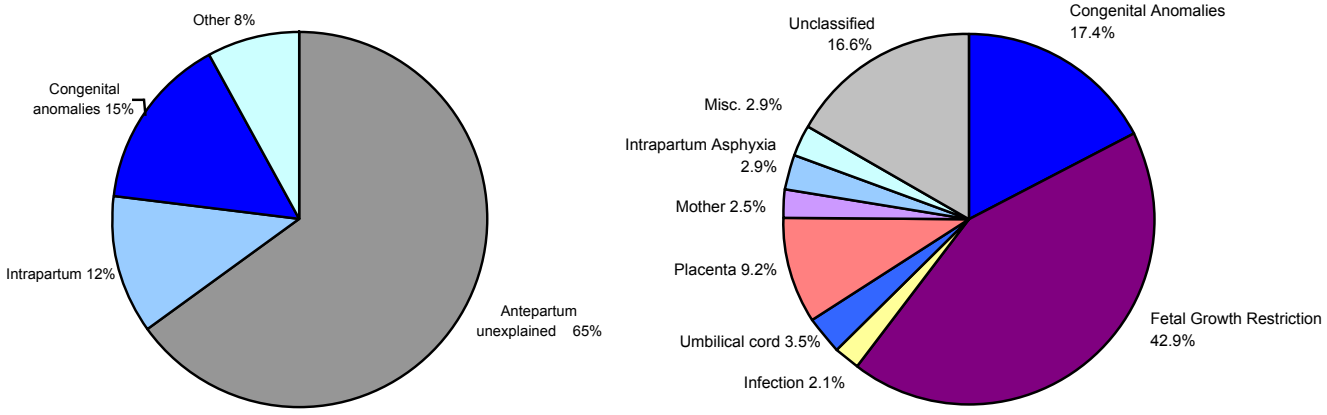

Fig. 1 – Proportion of stillbirths designated 'unclassified' or 'unexplained' by Wigglesworth (left) and ReCoDe classifications According to ReCoDe, the largest category of stillbirths (43% in this sample) have fetal growth restriction (Ref. 5).