Anaesthesia for fetal distress

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The physiological changes of pregnancy create a favorable environment for the fetus in terms of oxygen supply and demand. Acute decreases in uterine blood flow, which may be superimposed upon chronic placental disease, commonly precipitate the need for urgent delivery. “Fetal distress” implies compromise of the fetus during the antenatal or intrapartum period. An explanation for the observed “fetal distress” should be determined as this will dictate further management. The main concern is fetal hypoxia. Subsequent “intrauterine resuscitation” should include attention to maternal haemodynamics, discontinuation of oxytocics, acute tocolysis, intrauterine saline infusion, and administration of supplemental oxygen to the mother.

The provision of anaesthesia for emergency caesarean section (CS) is a major challenge for the obstetric anaesthetist, both in sophisticated environments and in the developing world. Data from the UK indicates that the rate of CS for fetal distress has escalated significantly in the last two decades.

Changes in the cardiotocograph (CTG) trace alone, while very sensitive, have a low specificity in the prediction of hypoxia, neonatal acidosis and poor neurological outcome. There is now widespread acceptance of the term “non-reassuring fetal heart trace” and specific recommendations were recently published by the Royal College of Obstetricians and Gynaecologists (RCOG) which may improve the interpretation and prognostication of CTG monitoring. These recommendations aid the classification of the CTG as “normal”, “suspicious” or “pathological”.

One international consensus statement suggests that most neurological pathology causing cerebral palsy is not preventable and occurs during fetal development or in the neonatal period. However, a study employing MRI and postmortem examination in infants with neonatal encephalopathy, strongly suggests that events in the immediate perinatal period may be as important in the causation of neonatal brain injury.
The assessment of the influence of anaesthesia on neonatal outcome is problematic, since there are often a number of factors affecting neonatal outcome. Ideally, the influence of anaesthesia on neonatal outcome should be a long term assessment of morbidity and mortality in large patient cohorts. This is seldom feasible; thus surrogate markers Apgar scores and cord gas values are employed, which often have a low positive predictive value for a poor neurological outcome.

The method of anaesthesia may affect neonatal outcome by transplacental drug transfer, and by influencing maternal haemodynamics and hence placental perfusion during the anaesthesia induction to delivery period.

The importance of delays in caesarean delivery is controversial. After a recent UK audit, 4 categories of urgency gave been defined for CS, and a decision to delivery interval of <30 minutes has been recommended for Category 1 cases (immediate threat to the life of woman or fetus). Some studies have examined the influence of delays in caesarean delivery in the setting of pathological CTG’s, on neonatal outcome. A recent controversial case series described “rapid sequence spinal anaesthesia” as an alternative to general anaesthesia for urgent CS.

Guidelines for the management of urgent caesarean section for a fetal indication:

- The urgency of the procedure should be established, and the 30 minute rule, while a useful audit tool, is not an adequate time guideline for all cases. Certain cases (abruptio placentae, cord prolapse, uterine rupture) require a decision to delivery time of less than 15 minutes, but undue haste in situations which are not true emergencies may cause maternal and/or fetal harm due to anaesthesia complications.
- Intrauterine resuscitation should be initiated immediately. Interventions to improve uterine blood flow, such as left lateral tilt and acute tocolysis, are probably more important than maternal oxygen supplementation, although this may be beneficial in cases of placental insufficiency.
- The decision as to the method of anaesthesia is a balance between the degree of urgency and the level of concern about maternal risks of general anaesthesia. Spinal anaesthesia is associated with a statistically, but usually not clinically significantly increased time from decision to operate to induction of anaesthesia. In cases of imminent fetal demise, this delay may become
clinically significant. Spinal anaesthesia has been shown to be associated with a statistically significantly greater fetal base deficit than general anaesthesia. This should not influence the choice of anaesthesia, since the current practice of employing phenylephrine for the management of spinal hypotension probably reduces this difference.

- In the event of fetal distress, early and effective communication between obstetrician and anaesthetist cannot be over-emphasized.

Key references
