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Reliability of cardiocography in predicting baby's condition at birth

SIR,—The paper by Professor P Curzen and colleagues (17 November, p 1345) importantly highlights the poor correlation between fetal condition and cardiocography as currently used in clinical practice. They suggest a diagnosis of fetal hypoxia on the basis of late decelerations accompanied by baseline tachycardia or loss of baseline variability. Parer states that wellbeing is assured as long as there is normal baseline variability.¹ Other workers have found that no single pattern considered in isolation has a statistically significant adverse effect on fetal prognosis. When found in combination with others, however, even patterns considered benign had a prognostic value.² Based on the scoring system developed for antenatal traces, Krebs *et al* developed a prediction system using fetal heart rate baseline and periodic changes which yielded improved predictability of Apgar score.³

It is unfortunate that Professor Curzen and his colleagues did not see fit to check retrospectively the traces. Human error is one of the major problems of monitoring (R W Beard, paper delivered at Royal College of Obstetricians and Gynaecologists, 1977). The contribution of observer error would give an indication of how far the reliability of cardiocography could be improved by putting more emphasis on interpretation and improved understanding of the physiological basis of changes in fetal heart rate.

Their choice of one minute Apgar score as an index of fetal condition is also unfortunate, for, while Apgar scores remain widely used, there is no doubt that five minute Apgar scores are a more reliable index of asphyxia; in particular, five minute scores are less affected by other causes of respiratory depression such as opiates.

The past decade has seen a great improvement in the outlook for preterm deliveries, particularly for infants weighing less than 1500 g and those born before 28 weeks. It has also seen rapid growth in prenatal diagnosis, allowing selective termination or optimal timing, mode, and place of delivery. In contrast, the wastage of normally formed term babies from birth asphyxia remains a major problem. Unlike prematurity, no amount of excellence in paediatric care has any real impact on the prognosis of the severely asphyxiated infant. Thus attainment of a reliable means of monitoring fetal condition in utero is perhaps the most urgent priority in perinatal care.

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SIR,—The data presented by Professor P Curzen and colleagues fail on two counts to

add anything to our current knowledge concerning the value of intrapartum monitoring. Firstly, the fact that a normal trace is almost invariably associated with a good neonatal outcome while an abnormal one will often be present when the baby is born in a better than expected condition has been known for years.¹ Of crucial importance, however, is the fact that, for several reasons, their data are impossible to interpret. Firstly, the assessment of the neonate using only the one minute Apgar score as an indication of fetal hypoxia is often inappropriate. Secondly, using ventilatory support as a criterion for fetal hypoxia is very dubious, particularly because gestational age is not indicated in the paper. Finally, there is no attempt to show the duration of the cardiocographic abnormalities or the relation to the time of delivery.

As it stands the paper's findings are of little significance, and it would be most helpful if the authors could address the above points.

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- 1 Schifrin BS, Dame L. Fetal heart rate patterns. Prediction of Apgar score. *JAMA* 1972;219:1322-5.

* * * The authors reply below.—ED, *BMJ*.

SIR,—We thank Dr Pillai and Mr Whittle for their comments on our paper. We deliberately did not check false positive and false negative traces retrospectively in our study because it was designed to assess the prognostic value of cardiocography on an in service basis. While observer error may contribute to any inherent failure of method, this could probably be eliminated only by the use of a standardised computer analysis of tracings. We know that this approach is being tried, but we are not aware of any published evidence to suggest that it significantly improves the prognostic value of cardiocography.

We do not agree that the Apgar score at five minutes is better than that at one minute as an indicator of the baby's condition at birth because by five minutes active resuscitative measures such as intermittent positive pressure ventilation and the administration of bicarbonate are likely to have brought about considerable improvement. We are not the only ones to have used an Apgar score of less than 7 as an outcome criterion, but, recognising that this is a rather arbitrary cut off point, we also included the use of intermittent positive pressure ventilation. This seems to us to be an indisputable criterion of a baby in poor condition.

The occurrence of some false positive and false negative predictions when using cardiocography has certainly "been known for years." Our purpose was to draw attention to the magnitude of the problem in current practice; 73% of grossly abnormal tracings were associated with the birth of a baby in good condition, and only 23% of babies whose one minute Apgar score was less than 7 had abnormal tracings.

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Cardiac arrest after treatment with intravenous domperidone

SIR,—We were concerned to read the report by Dr J B Roussak and his colleagues (8 December, p 1579) describing four cases of cardiac arrest in patients receiving relatively high dose intravenous domperidone for nausea and vomiting induced by cytotoxic therapy.

Domperidone is an effective antiemetic drug¹ that is used extensively both in the United Kingdom and abroad. Ever since the 1982 report of a case of suspected cardiac toxicity after an intravenous bolus of domperidone 200 mg,² we have advised that the drug should be given to patients receiving cytotoxic therapy as an infusion diluted 1/10 with saline over 15-20 minutes; the datasheet was amended accordingly. The four patients reported on by Dr Roussak and others received doses that exceeded the datasheet recommendations, two receiving an intravenous bolus of domperidone while the others received the drug as an infusion.

As in the earlier case report mentioned,² there are other possible causal factors for a cardiac arrhythmia in these circumstances. Patients receiving cytotoxic therapy often have a diuresis induced with intravenous fluids and diuretics to help protect against nephrotoxicity, and this can lead to reduced concentrations of plasma potassium and magnesium, both of which may be arrhythmogenic^{3,4}; all four patients reported on by Dr Roussak and his colleagues (not three as stated) were hypokalaemic after the cardiac arrest, two of them having plasma potassium concentrations less than 3.0 mmol(mEq)/l. Indeed, with the metabolic acidosis that accompanies a cardiac arrest these values may be an overestimate of the true tissue potassium concentration. The established cardiotoxicity of cytotoxic drugs—for example, daunorubicin⁵—may also be relevant.

We have no real evidence to suggest that high dose intravenous domperidone is any more effective in these patients than the dose outlined in the datasheet. We would advise that the datasheet recommendations should be strictly followed when intravenous domperidone is prescribed for patients receiving cytotoxic therapy.

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Medical journals in the Third World

SIR,—I support wholeheartedly Dr Richard Smith's suggestion (15 December, p 1684) that a broadsheet aimed at doctors and primary care workers would be far more useful than a medical journal in the Third World countries. Such journals in low resource countries tend to be hospital orientated, of little relevance to the health needs of the country, and read more