Health effects of organophosphate sheep dips

EDITOR,—We wish to draw attention to the possible health effects of exposure to sheep dips containing organophosphates (diazinon, propetamphos, or chlorfenvinphos). Toxic exposure to organophosphate substances may cause acute cholinergic inhibition¹ that correlates poorly with clinical effects.² Acute clinical effects after exposure to organophosphate dips are uncommon, and because these effects are non-specific, resembling influenza, diagnosis may be difficult.

During the dipping season last year (22 September to 3 November) the National Poisons Unit, in collaboration with the Veterinary Medicines Directorate of the Ministry of Agriculture, Fisheries and Food, investigated cases of suspected exposure reported to the poisons unit by doctors requesting information on management. We obtained details of the cases by telephone and by sending follow up questionnaires to the doctors. If a case was reported within seven days of exposure the doctor was asked to take a blood sample (5 ml EDTA) straight away and another at least one month later. The National Poisons Unit Laboratory measured erythrocyte and plasma cholinesterase activities with an assay based on the method of Ellman *et al.*^{3,4}

Thirty four reports were received. The age of the patients, recorded in 31 cases, ranged from 2 to 75 years. Twenty nine patients were exposed while working with sheep, but three were exposed accidentally, including a 2 year old child who fell into a dip. Circumstances were unknown in two cases.

Influenza-like symptoms, probably associated with organophosphate toxicity, were reported by 23 patients after occupational exposure. Fifteen of them reported that they had not worn protective clothing as recommended by the Health and Safety Executive⁵ and had probably been contaminated while putting sheep into a dip or handling recently dipped sheep.

Paired blood samples were obtained from nine of the occupationally exposed patients with influenza-like symptoms. In three patients a rise in the erythrocyte cholinesterase activity of at least 25% four to six weeks after exposure indicated that cholinesterase activity had been depressed, but in six patients measurements were either equivocal or did not show increased activity (copies of full report available from Mrs J Stear, Veterinary Medicines Directorate, New Haw, Addlestone KT15 3NB).

These findings are a matter of concern. To obtain more information about the scale and severity of the problem and formulate prevention strategies the National Poisons Unit is continuing surveillance between September and December this year in cooperation with the Veterinary Medicines Directorate, the Department of Health, and the Health and Safety Executive; we urge doctors to report suspected cases of exposure to the

unit. This surveillance is separate from the pesticide green card scheme operated by the West Midlands Poisons Information Centre for the Trent and West Midlands regions.

We are grateful to the Veterinary Medicines Directorate of the Ministry of Agriculture, Fisheries and Food, which contributed to the funding of the surveillance, and for information from the directorate's suspected adverse reaction surveillance scheme for veterinary medicines.

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Outcome of breech delivery at term

EDITOR,—We disagree with J G Thorpe-Beeston and colleagues' conclusion that elective caesarean section is the safest method of delivering babies presenting by the breech at term.¹ There was not a randomised controlled trial, and therefore the three delivery groups (elective caesarean section, emergency caesarean section during labour, and vaginal breech delivery) were not comparable.

Their study showed that vaginal breech delivery was associated with a 20-fold increase in the rate of perinatal loss—this despite the fact that a lower rate of perinatal loss might be expected in the group selected for vaginal breech delivery compared with the group delivered by elective caesarean section since high risk pregnancies would normally be assigned to elective caesarean section. The high rate of perinatal loss found in this study will justify the authors' conclusions only if they can clearly show that the cases for vaginal delivery were both selected and managed optimally. The paper provides no information on either of these two important issues.

Traditional criteria for selecting cases suitable for vaginal breech delivery include: estimated fetal weight (by clinical and ultrasonographic methods) between 2500 and 3500 g; an engaged, extended breech presentation in nulliparous women or a well flexed breech presentation in multiparous women; exclusion of hyperextension of the neck; no evidence of intrauterine growth retardation with normal volume of liquor; absence of placenta praevia; normal clinical and radiological pelvimetry; avoidance of induction or augmentation of labour; satisfactory progress during the first and second stages of labour; avoidance of breech extraction; and maintenance of good head flexion during delivery.

To assess the importance of the eight deaths in

the vaginal delivery group, detailed information must therefore be provided on compliance with these antenatal selection criteria and on the likely causes of death. How many of these deaths were related purely to the mechanism of breech delivery as opposed to factors that may equally apply to labour and vaginal delivery of fetuses with a cephalic presentation?

The policy advocated by Thorpe-Beeston and colleagues was responsible for a fifth of all caesarean sections performed at the Queen Mother's Hospital in 1991 and will increase the likelihood of caesarean sections in subsequent pregnancies. Spontaneous labour with a cephalic presentation is not without risk; the association between meconium staining of the amniotic fluid in labour and increased perinatal loss is well recognised² but in itself does not justify routine caesarean section. Feldman and Freiman advocated routine "prophylactic" caesarean section at term for all mothers in an extreme attempt to remove these fetal risks, but at the cost of an increase in maternal mortality.³

Thorpe-Beeston and colleagues' conclusion must be challenged because, otherwise, the profession would be obliged to deliver all mothers with breech presentation at term by caesarean section on the basis of these inadequate data.

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- 1 Thorpe-Beeston JG, Banfield PJ, Saunders NJStG. Outcome of breech delivery at term. *BMJ* 1992;305:746-7. (26 September.)
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EDITOR,—J G Thorpe-Beeston and colleagues' paper shows the problems of retrospective analysis of computer data.¹ It is true that no prospective randomised trials of sufficient size exist to answer the difficult question of the best mode of delivery for breech presentation at term, but should we advocate wholesale operative delivery of pregnant women on the basis of this retrospective analysis?

The number of maternal deaths associated with caesarean section in England and Wales has continued to fall,² but, despite this, during the last triennium deaths associated with caesarean section made up a larger proportion of all direct maternal deaths than in previous years. Death associated with operative delivery is now rare; thus we need to look at the morbidity associated with caesarean section to assess outcome and acceptability.

Despite the worldwide increase in the caesarean section rate few studies have attempted to assess morbidity. In a recent prospective assessment of complications associated with caesarean section at King's College Hospital we found appreciable morbidity associated with both elective and emergency procedures (unpublished study). This included major events such as hysterectomy (0.9%), anaesthetic complications (2.3%), admission to the intensive care unit (2.9%), infection (36%), major postpartum haemorrhage (5.4%), wound breakdown, and also ileus, pain, immobility, and other short term problems. In addition, the long term

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psychological and physical consequences of abdominal delivery other than those directly affecting subsequent pregnancies are often overlooked.

From a review of the literature Bingham and Lilford concluded that planned abdominal delivery of fetuses presenting by the breech at term might be a safer option for the mother even if only 17% of trials of vaginal breech delivery were unsuccessful.¹ However, the authors used estimates of maternal mortality and morbidity, and postpartum hysterectomy was the only measure of serious postpartum morbidity. Long term morbidity after discharge from hospital was not addressed.

Feldman and Freiman, using a mathematical analysis of American data (Commission on Professional and Hospital Activities 1974 and 1978), calculated that routine elective caesarean section might be safer when the incidence of failed trial of labour was greater than 26%.¹ They also concluded that the excess maternal mortality resulting from a complete shift of all women in labour to prophylactic caesarean section would be 1 in 18000. No measure of morbidity was included in this analysis, and the authors concluded that extrapolating retrospectively accumulated data to projections in hypothetical new approaches could lead to unreliable conclusions.

Unfortunately, Thorpe-Beeston and colleagues have not told us why the nine "normal" term infants died; possibly, breech presentation was undiagnosed, the mothers presented in advanced labour, or there was cord prolapse. Such accidents would occur even if a policy of wholesale caesarean section was introduced.

Certainly, delivery in breech presentations at term should be made safer, but before a shift away from vaginal breech delivery is advocated the impact this would almost certainly have on both morbidity and mortality for the delivering mother must be addressed.

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- 1 Thorpe-Beeston JG, Banfield PJ, Saunders NJ. Outcome of breech delivery at term. *BMJ* 1992;305:746-7. (26 September.)
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EDITOR,—We acknowledge the importance of obtaining accurate information on the risks associated with the modes of breech delivery in order to counsel women appropriately. With regard to the paper by J G Thorpe-Beeston and colleagues,¹ however, we wonder whether a fairer comparison would have been between intention to treat by elective caesarean section and by vaginal delivery rather than between the actual outcome of vaginal and operative delivery. If we assume that the women who had emergency caesarean section started labour intending to attempt a vaginal delivery this would mean that eight intrapartum and neonatal deaths occurred in the 1990 women who tried for vaginal delivery no matter what the eventual outcome (incidence 0.40%) and one death occurred in the 1457 women who had an elective caesarean section (incidence 0.07%). With these figures there is no significant difference in the death rate between the two groups ($\chi^2=2.42$, $p=0.12$). The relative risk is now 5.9 (95% confidence interval 0.7 to 47) rather than 20 as calculated by the authors.

The group who went into labour is likely to have included those with precipitate delivery, previously undiagnosed breech presentation, and

unbooked mothers, who will be more at risk of a poor outcome. Any woman presenting in established labour whose fetus was found to be dead on initial examination would presumably have been classified as having an intrapartum death and been allowed to deliver vaginally. Are the reported deaths in the vaginal delivery group attributable to the process of labour or are they a direct result of the second stage and delivery process? It would have been useful to determine whether a single factor such as the use of oxytocin or lack of senior staff in attendance could be implicated. To answer these questions requires a more complete description of the circumstances surrounding the deaths.

Already this paper is being commented on in both the medical and lay press. We are disturbed that a medical newspaper described the findings as a "clinical trial" which showed that "elective Caesarean section is far safer than vaginal delivery."² We accept that vaginal breech delivery is associated with intrapartum and neonatal risks, but any retrospective study is liable to bias, possible examples of which are suggested above. We agree that a prospective randomised controlled trial is unlikely to be practical and therefore data such as those produced by Thorpe-Beeston and colleagues are valuable. It is important, however, that any confounding factors are considered before a relative risk of 20 to 1 becomes an assumed fact.

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- 1 Thorpe-Beeston JG, Banfield PJ, Saunders NJStG. Outcome of breech delivery at term. *BMJ* 1992;305:746-7. (26 September.)
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EDITOR,—N J Thorpe-Beeston and colleagues' study does not support caesarean section as the only choice in breech presentation at term, which is what the authors imply.¹ As the authors admit, the ideal would have been a large randomised controlled trial. Though the mode of delivery for most of the women will have been carefully considered, many of the vaginal deliveries may have been unplanned. The authors are justified only in comparing planned vaginal delivery with planned caesarean section. Personal experience with the St Mary's maternity information system (both within and outside the North West Thames region) leads me to conclude that data entry is not invariably reliable (even presentation and mode of delivery are sometimes wrongly recorded). Are the authors confident that their database is accurate?

Unplanned vaginal breech delivery will always occur. If planned vaginal breech deliveries cease how will anyone be trained to cope with unplanned ones?

The apparently improved neonatal outcome after caesarean section must be balanced against the increased maternal morbidity and potential maternal death.

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- 1 Thorpe-Beeston JG, Banfield PJ, Saunders NJStG. Outcome of breech delivery at term. *BMJ* 1992;305:746-7. (26 September.)

EDITOR,—J G Thorpe-Beeston and colleagues studied their regional obstetric database for data on singleton fetuses presenting by the breech at term and report a 20-fold increased risk of intrapartum

or neonatal death for those fetuses delivered vaginally compared with those delivered by caesarean section.¹ This relative risk is much higher than the 5.6 in Kiely's much larger series of 17 587 singleton liveborn infants presenting by the breech.² The lower limit of the confidence interval (2.5) in Thorpe-Beeston and colleagues' study, however, is consistent with similar retrospective uncontrolled population studies.³⁻⁴

The excess deaths in infants born vaginally presumably result from trauma or asphyxia if directly attributable to vaginal breech delivery. The authors, however, do not give any information on the cause of these deaths, which may instead have been attributable to problems unrelated to presentation such as infection, abruption, or intrauterine growth retardation. Certainly, smaller babies are more likely to be selected for vaginal delivery.

If vaginal breech delivery does carry specific risks of trauma and asphyxia these should also be reflected in neonatal morbidity. Taking admission to special care baby units as the best indicator of serious morbidity (a low Apgar score or intubation without such admission probably being of little consequence), neonatal morbidity actually occurred less commonly in babies delivered vaginally (5.6%) than in those delivered by caesarean section (5.9%).

The authors have merely described a single association without providing supporting data or addressing the issues of confounding or biological plausibility. Indeed, an article in the same issue of the *BMJ*, reviewing the phenomenon of confounding in studies, warns of the high susceptibility of a study such as this to the production of spurious associations.⁵ Thorpe-Beeston and colleagues argue that if mothers and obstetricians were informed of this increased risk of vaginal delivery in breech presentation at term most would opt for caesarean section. Such a conclusion may have an unwarranted impact on both clinical and medicolegal practice.

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EDITOR,—J G Thorpe-Beeston and colleagues attempt to resolve the question of the safest mode of delivery for fetuses presenting by the breech at term.¹ Reassuringly, they found that elective caesarean section was associated with a good neonatal outcome. They acknowledge that their study had potential limitations, but, unfortunately, these limitations mean that the question of how to plan delivery will linger.

The number of perinatal deaths of apparently healthy babies presenting by the breech (nine) was small, and the nature of the database means that cases cannot be assessed individually to see whether the deaths were potentially avoidable or related to the mode of delivery. We do not know how individual women were selected for trial of vaginal delivery; the ways in which they were selected and managed probably varied considerably. In some cases breech presentation was probably diagnosed late, either in labour or even during delivery. This group would be at potentially higher risk since there would probably not have been time for full