passed rectally. Earlier diagnosis might have resulted in the survival of case 1, and reduced the morbidity in case 2.

If a rectal thermometer is passed and the end inspected, it not only allows a check on the colour of the rectal contents (if any) but also ensures that any anorectal abnormality is detected immediately. The paediatrician called to the delivery should do this himself.

Absence of meconium in the rectum should alert the paediatrician to the possibility that the baby does not have meconium stained liquor, but intestinal obstruction with bile stained vomiting in utero.

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Mercury concentration in cord blood

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SUMMARY The mean mercury concentration measured in cord blood from 51 inner city babies born at Guy's Hospital was significantly higher (37 nmol/l v 20 nmol/l) than that from 17 babies born at the Royal Devon and Exeter Hospital, which serves a more rural population.

The finding of a mercury concentration well above that believed to be 'normal' (from experience with adults) in the cord blood from an infant at Guy's Hospital who died during the neonatal period prompted a literature search for normal values in cord blood. None were found for infants in the United Kingdom, though values are published from other parts of the world, particularly where mercury toxicity is a recognised problem.¹ Analysis, for mercury, of cord bloods from other babies at the hospital (which serves an area of inner London) showed an unexpectedly high mean concentration; this suggested the possibility of environment exposure and prompted a comparison study with infants born in a rural environment.

Patients and methods

Samples of cord blood (5 ml) were obtained from 51 randomly selected babies of normal deliveries at Guy's Hospital from patients living in inner London and from 17 deliveries at the Royal Devon and Exeter Hospital, which serves a rural environment. In both centres the samples were taken from fresh placentas by needle puncture of a placental vein. The specimens were immediately transferred to a heparinised blood tube and stored at -20° until

analysed by one of us (IMH). No information was collected about mothers in relation to possible environmental or occupational exposure to mercury.

Total whole blood mercury was measured by cold vapour atomic absorption spectrometry with a Varian 475 spectrometer by an unpublished method, based on that of Hatch and Ott,² after destruction of the organic material in the samples with a mixture of nitric and sulphuric acids and potassium permanganate. The limit of detection of the method varied between 2.5 and 7.5 nmol/l with a coefficient of variation of 20% at 25 nmol/l. An internal quality control sample that was measured periodically gave a mean (SD) of 50 (2.5) nmol/l. Statistical analysis was by Student's *t* test after log transformation of the data.

Results

Mercury concentrations in cord blood from samples from the rural population were normally distributed about a geometric mean of 20 nmol/l (95% range 11–36 nmol/l). Mercury concentrations in the samples from the inner London population had a skewed distribution with a geometric mean of 37 nmol/l (95% range 10–139 nmol/l) (figure). There was a significant difference between the means of the two groups ($t=9.63$; $df=67$; $p<0.00001$).

Discussion

The pathophysiological importance of these findings is unclear. Mercury toxicity is unlikely below a blood concentration of 1000 nmol/l,³ though Pink disease can be seen in infants and children at

Figure Mercury concentrations in cord blood in infants born at Guy's Hospital (●); and in infants born at the Royal Devon and Exeter Hospital (○).

mercury concentrations considerably below this (unpublished work). It is recommended, however, that the blood concentration of mercury in workers exposed in industry should be below 150 nmol/l. Furthermore, mean concentrations of mercury in cord blood in different parts of the world, vary from 6 nmol/l,¹ to as high as 100 nmol/l.⁴ Organic mercurials cross the placenta much more readily than inorganic salts so that an organic source of environmental contamination should be considered.^{3 4}

Mercury is certainly toxic to the fetus⁴ and its use

in treatment of syphilis increased the rate of abortion.⁵ A relation between the concentration of mercury in cord blood and the incidence of previous stillbirth was shown in a study from America even though the concentrations were low (mean 6 nmol/l).⁶ The correlation was weak and no causality could be inferred. It is also known that placental concentrations of some forms of mercury may be much increased (perhaps 15 fold), compared with cord blood.¹

The Royal Devon and Exeter Hospital serves mothers who live in a small city, with only light industry, or in the country. In contrast, mothers delivering at Guy's Hospital live in one of the most depressed parts of a large city. The differences in environment between the two centres are so numerous that it would be a major task to pinpoint the cause or causes of the presumed increased exposure to mercury occurring in this part of London. There are also many differences in the pattern of morbidity between rural and inner city populations. For example, the incidence of low birth weight is 6% in Exeter compared with 9% in the local population that Guy's Hospital serves. Our observations suggest the need for further studies of concentrations of blood mercury in mothers and neonates born in the United Kingdom.

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