no known unique quality. Historically a major commitment to the cotton industry has been a feature of the high prevalence area, yet other towns also associated with the cotton industry—for example, Rochdale—have low prevalences.

We are most grateful to the radiologists, radiographers, and x-ray records staff in the towns surveyed. Their kindness and help made the survey possible. The study was funded by a grant from the Department of Health and Social Security.

SHORT REPORTS

Prenatal chromosomal analysis of fetal blood obtained at fetoscopy

Cultivation of amniotic fluid cells for prenatal diagnosis may take several weeks. But the fetal karyotype in a mother who presents in an advanced stage of pregnancy may need to be determined within a few days. We describe here a method of doing a fetal chromosomal analysis within 72 hours. Fetoscopy samples of mixtures of fetal blood and amniotic fluid^{1 2} are cultured by a modified technique of micro-culturing whole blood. We also report our first clinical application of the method.

Patients, methods, and results

The fetuses of 14 women in the 16th to 23rd week of gestation were studied. Thirteen of the women had been admitted for therapeutic abortion. In one of them fetal trisomy 18 had been diagnosed by amniocentesis. The remaining woman was a case for diagnosis. She had had a child with Down's syndrome. In the 22nd week of her gestation it became obvious that a second attempt to culture amniotic fluid cells had failed. Since she refused to accept the risk of having another affected child she agreed to prenatal diagnosis by analysis of fetal blood obtained at fetoscopy.

The site of the placenta and the position of the fetus were determined by ultrasound immediately before fetoscopy. Under direct visual control (Dyonics Needlescope) a placental vessel was punctured without any attempt at cannulation. A sample (2 ml) of blood mixed with amniotic fluid was aspirated and immediately transferred to a glass tube containing 3.5 IU heparin. After centrifugation at 125 g for 10 minutes the supernatant was discarded and the cell button was deposited in a 6-ml Falcon plastic tube containing 1 ml McCoy's 5a medium (Flow Laboratories) with 20% fetal bovine serum and 0.026 ml phytohaemagglutinin supplemented with streptomycin and benzyl penicillin. After incubation for 65-70 hours at 37°C cell growth was stopped by adding colchicine in a final concentration of 0.125 µg/ml. After hypotonic treatment with potassium chloride 0.075 mmol/l for 10 minutes at room temperature the cells were fixed in three parts methanol and one part acetic acid. Slides were prepared with the standard air-drying technique. The chromosomes were stained with the trypsin-Giemsa banding technique according to Seabright³ as slightly modified by Özkinay and Mitelman.⁴

Analysable metaphase plates were obtained in 12 out of the 14 cases (table). The fetus of the woman who had borne a child with Down's syndrome had a normal karyotype (46,XY) and at birth was normal, as predicted. The diagnosis in the case of fetal trisomy 18, established by

Chromosomal analysis in fetoscopy samples*

Fetoscopy case No	Gestational age (weeks)	Amount of blood (µl)	No of analysable metaphases	Karyotype
1	18	130	2	46,XY
2	16	70	3	46,XY
3	19	<10	0	
4	19	400	58	46,XX
5	22	280	>100	46,XX
6	23	90	73	46,XX
7	19	20	1	47,XY,+18
8	19	<10	0	
9	17	30	7	46,XY
10	18	40	4	46,XY
11	22	50	>100	46,XX
12	18	280	>100	46,XX
13	22	130	24	46,XX
14†	22	520	>100	46,XY

*Mixtures (2 ml) of fetal blood and amniotic fluid. The percentage of fetal red blood cells (Kleihauer technique) was 80-90% in samples in cases 1 and 4; the remaining samples contained >95% fetal red blood cells.

†Diagnostic fetoscopy in a woman who had borne a child with Down's syndrome.

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amniocentesis, was verified in the fetoscopy sample. Examination of the fetuses after the abortion showed that sex prediction was correct in all of them.

Comment

The essential step in the procedure seems to be centrifuging the mixed sample before culture. Our first attempts to culture the cells without previous centrifugation usually failed. Pure fetal blood uncontaminated with amniotic fluid⁵ would certainly be more suitable for culture than a mixed sample. But sampling pure fetal blood at fetoscopy requires cannulation of the placental vessel with a risk of penetrating the chorionic plate and consequent admixture of maternal blood in the sample. The procedure proved diagnostically reliable in the clinical case. Within three days we could tell the woman that the results of our chromosomal studies were normal. This was later confirmed by the birth of a normal infant.

Although amniocentesis remains the method of choice for prenatal diagnosis of chromosomal abnormalities the procedure described may prove a useful alternative when it is impracticable to wait about three weeks for the results of amniotic fluid cell culture.

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"Catabolic" loss of body protein after human liver transplantation

Little is known about the metabolic response to orthotopic liver transplantation. The trauma and length of the operation would be expected to evoke a major "catabolic" response in normal patients. Furthermore, the routine postoperative high doses of prednisolone to prevent graft rejection would be expected to increase catabolism further. On the other hand, such a response, with increased urea nitrogen excretion in the urine, would be suppressed if the transplanted liver failed to function normally since protein is oxidised and urea synthesised by the liver. Moreover, patients depleted of protein,