Growing embryos in vitro, with special reference to congenital abnormalities in the offspring of mothers with diabetes mellitus

A leading article in *Nature*¹ points out that mammalian embryologists have been slow to exploit the possibilities of whole embryo culture. The recent advances and the present position are discussed in the article.

Of particular interest to me was the work of Elizabeth Deuchar, sadly recently deceased, who investigated the fate of rat embryos in mothers rendered diabetic by either alloxan or streptozotocin. In the first paper that I read² she concluded that the evidence pointed fairly definitely to the fact that the drug-induced diabetes in the mother was mainly responsible for the fetal deaths and abnormalities which she recorded. It could not, however, be ruled out that the drugs themselves or their breakdown products could produce abnormalities. She thought that the caudal regression syndrome which was characteristic of the experimental animals might be directly attributable to high levels of fetal insulin in response to maternal hyperglycaemia.

In a later paper³ the matter is pursued, and the most interesting finding was that 10-day rat embryos cultured in diabetic female rat serum exhibited two favourable effects. Fewer embryos showed cell death than in normal serum, and the size of embryos at

the end of culture in diabetic serum was significantly larger than those cultured in normal serum. These comparisons held both for embryos from non-diabetic rats and for those from diabetic rats.

There seems little doubt that, in man, mothers with diabetes are more likely to have babies with congenital abnormalities than are controls,⁴ and the rat embryo may be useful in deciding what metabolic abnormalities are responsible.

C A CLARKE

References

- ¹ Morriss G. Leading article. Growing embryos *in vitro*. *Nature* 1979;278:402.
- ² Deuchar EM. Experimental evidence relating fetal abnormalities to diabetes. In: Sutherland HW, Stowes JM, eds. *Carbohydrate metabolism in pregnancy and the newborn*. Berlin: Springer Verlag, 1978:247-63.
- ³ Deuchar EM. Teratogenic mechanisms. In: Persaud TVN, ed. *Advances in the study of birth defects*. vol 1. Lancaster: MTP Press, 1979.
- ⁴ Day RE, Insley J. Maternal diabetes mellitus and congenital malformation. *Arch Dis Child* 1976;51:935-7.

Readers are invited to submit short signed abstracts of papers from other journals which have interested them. The abstracts will be subject to the usual refereeing procedure.