

Correspondence

Journal of Medical Genetics (1970). 9, 250.

Sir,

A point that is often not considered when discussing monozygotic twins is the fact that they may have shared a common circulation *in utero*; and this fact could have some considerable bearing on the case of a hypothyroid baby whose identical twin developed thyroxicosis at puberty, described by Townes and Bradford in your December 1971 issue.

In practical terms the fetus regulates its own thyroid activity, placental transfer of maternal thyroxin normally being of little significance (Soloman and Friesen, 1968). If twins A and B had a significant degree of cross circulation then changes in the thyroid function of one twin could affect both twins. There are several hypotheses that could explain the association of athyretic hypothyroidism in twin A with hyperthyroidism in twin B, if one accepts that the pattern of secretion of thyrotrophin releasing hormone (TRH) by the hypothalamus is 'set' at a particular response level sometime during fetal life.

If the thyroid failed to develop in twin A, the hypothalamic-pituitary-thyroid activity would increase in twin B so as to produce thyroxin for both twins. The pattern

of TRH secretion could become 'set' at a higher level in twin B and with the activation of hypothalamic activity at puberty contribute towards her hyperthyroidism. Alternatively a pathological process destroying the thyroid gland in twin A could release antigens capable of initiating the formation of long-acting thyroid stimulator (LATS) in both twins; and in twin B for some reason the full production or effect of LATS was delayed until puberty.

Finally, the initial abnormality could have been a temporary hyperthyroidism *in utero* of twin B, which then suppressed the thyroid development in twin A; the hyperthyroidism recurring again in twin B at puberty.

Yours, etc,

Marcus Pembrey

REFERENCES

- Townes, P. L., and Bradford, W. L. (1971). Congenital hypothyroidism and hyperthyroidism in monozygotic twin girls. *Journal of Medical Genetics*, 8, 471-477.
- Soloman, S., and Friesen, H. G. (1968). Endocrine relations between mother and fetus. *Annual Review of Medicine*, 19, 399-430.