Correspondence

Growth hormone treatment increases the predicted adult height

Sir,

In 1979 Hamilton¹ suggested that the luteinising hormone that contaminates growth hormone used in this country (hGH(UK)) might lead to accelerated bony maturation and stunting of adult height in treated patients. His paper has stimulated examination of the results of treatment of growth hormone-deficient patients at other centres in the UK. The paper by Milner *et al.*² in which is analysed the progress of patients, mainly from the Great Ormond Street growth clinic, is reassuring. The results of treatment with hGH (UK) of growth hormone-deficient patients in Newcastle upon Tyne, which were not included in the paper by Milner *et al.*, support their findings.

To assess the effect of growth hormone treatment in patients whose ages and duration of treatment vary greatly we calculated the difference between the predicted adult height at the beginning of treatment and at the present time. The Tanner method of predicting adult height³ takes into account not only age and height, but also bone age. As the formula was designed for use in normal children and as the growth velocity of children with growth hormone deficiency is low, the calculation will overestimate the predicted adult height at the start of treatment. Therefore any gain in adult height during treatment indicates a good response to treatment. The results of these calculations in all the growth hormone-deficient patients treated in our clinic since 1967 are shown in the Table.

Idiopathic growth hormone deficiency includes patients with associated gonadotrophin, antidiuretic hormone, and TSH deficiency; partial growth hormone deficiency is defined as a maximum growth hormone level of between 10 and 20 mU/l during an insulin tolerance test; organic panhypopituitarism includes patients with craniopharyngioma, glioma, astrocytoma, pinealoma, eosinophilic granuloma, and diffuse severe cerebral damage.

The gain in predicted adult height was not related to the growth hormone level during a diagnostic insulin tolerance test nor was it related to height at diagnosis, but it did

have a significant negative correlation with age at the start of treatment ($r = -0.25$, $P = 0.05$). All patients who started treatment before age 10 years showed a gain in predicted adult height; the few whose predicted adult height decreased slightly with treatment were all over age 10 years at the start of treatment. These findings confirm the beneficial effect of treatment with hGH (UK) and indicate the importance of early diagnosis and treatment.

References

- 1 Hamilton W. What can be expected from growth hormone treatment? (abstract). *Arch Dis Child* 1979; **54**: 971-2.
- 2 Milner R D G, Preece M A, Tanner J M. Growth in height compared with advancement in skeletal maturity in patients treated with human growth hormone. *Arch Dis Child* 1980; **55**: 461-6.
- 3 Tanner J M, Whitehouse R H, Marshall W A, Carter B S. Prediction of adult height from height, bone age, and occurrence of menarche, at ages 4 to 16 with allowance for midparent height. *Arch Dis Child* 1975; **50**: 14-26.

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Conservative care of the newborn baby

Sir,

We do not wish to enter the discussions about the merits of intensive or conservative care of the newborn, or about the criticism of the sampling techniques used by Hughes-Davies, but to discuss the use of statistics by Pearson.¹

Pearson correctly emphasises that when considering two small samples, only a large difference between mortality rates would be statistically significant. The 95% confidence limit for 16 deaths out of 21 subjects in Salisbury is 52.83-91.78% and for 32 deaths out of 40 subjects in UCH it is 64.35-90.95%.² Pearson accepts this variation for Salisbury but not for UCH when he constructs his hypothetical 2 × 2 contingency tables. He

Table Results for growth hormone-deficient patients treated at Newcastle upon Tyne

	Idiopathic growth hormone deficiency (n=28)	Partial growth hormone deficiency (n=8)	Organic panhypopituitarism (n=19)
Age at start of treatment (years)	Mean 11.2 Range (3.4-18.5)	11.4 (7.5-16.5)	12.3 (3.1-20.2)
Height at start of treatment (SD from mean)	Mean -4.3 Range (-2.8- -7.5)	-3.7 (-2.4- -5.0)	-3.0 (-0.3- -5.0)
Duration of treatment (years)	Mean 3.5 Range (0.5-10.1)	2.3 (0.5-9.9)	2.9 (0.5-9.0)
Gain in predicted adult height (cm)	Mean +6.0 SD (±5.8)	+2.0 (±2.8)	+2.1 (±9.1)