Short reports

Body proportions in Turner's syndrome

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SUMMARY Body proportion was studied in Turner's syndrome by measurement of standing and sitting heights in relation to chronological and bone age. The mean standard deviation score for standing height was -3.8 . Disproportionate growth of the legs was not a major determinant of short stature, either before or after oestrogen replacement.

Extreme short stature is a central feature of Turner's syndrome. Mean adult height was 142.5 cm in two reported series of cases.^{1,2} Disproportionate shortening of the legs has been suggested as a major determinant of short stature in the syndrome.³ We studied body proportions by measurement of standing and sitting heights related to chronological and bone age in a group of patients with Turner's syndrome referred to a regional growth clinic.

Patients and methods

The diagnosis of Turner's syndrome in 22 patients was confirmed by karyotype analysis on peripheral blood. There was no evidence that stature was significantly different in those with chromosome mosaicism or structural abnormalities.⁴ Their ages when studied ranged from 9 to 19.5 years (median age 13.8 years). Six patients were receiving oestrogen replacement to induce signs of puberty (mean (SD) age 16.9 (2.1) years).

Standing and sitting height measurements were performed by the same observer (JR) using a Harpenden Stadiometer and Sitting Height Table. Subischial leg length was obtained by subtracting sitting height from standing height. Standard deviation scores for sitting height and subischial leg length were calculated for chronological and bone age using published tables.⁵ Bone age was determined by the method of Tanner and Whitehouse (TW2).

Data were expressed as mean (SD) and differences analysed for significance using Student's *t* test.

Results

The standard deviation scores (mean (SD)) for sitting height and subischial leg length on the basis of chronological age in the untreated group were -3.28 (1.04) and -3.48 (1.01), respectively. For the treated group comparable values were -3.45 (0.64) and -2.65 (0.81), respectively. The differences between the means within and between the two groups were not significant.

Figure 1 shows the relation between sitting height and subischial leg length calculated for chronological age. The standard deviation scores were all

Fig. 1 Relation between subischial leg length standard deviation scores and sitting height standard deviation scores in Turner's syndrome according to chronological age (○=girls treated with oestrogen, ●=untreated girls).

*Dr P C R Hughes died on 2 January 1986.

Fig. 2 Relation between subischial leg length standard deviation scores and sitting height standard deviation scores in Turner's syndrome according to bone age (○=girls treated with oestrogen, ●=untreated girls).

negative. They were evenly distributed around the theoretical regression line, although in the treated group the values plotted to the right of this line (sitting height standard deviation scores more negative). When the data were plotted in relation to bone age (Fig. 2) the treated group were also evenly distributed. There was evidence for pronounced body disproportion in one patient (sitting height standard deviation score -1 , subischial leg length standard deviation score -3). Longitudinal growth measurements were available in some patients; body proportions were similar on each occasion.

Discussion

This study further documents the degree of short stature in Turner's syndrome. Mean standing height standard deviation score was -3.8 . Treatment with oestrogen, which in this study was given to induce signs of puberty, did not enhance final height (mean standard deviation score -3.7).

The sitting height deficit for chronological age seemed to be greater in girls treated with oestrogen.

This was probably related, however, to their older age as adult subischial leg length is achieved earlier than adult sitting height.⁵ There was no evidence that lower limbs were disproportionately shorter whether the measurements were related to chronological or bone age. This is in contrast to the findings of Neufeld *et al*, who reported markedly shortened lower extremities in 21 patients with Turner's syndrome.³ Their method of analysis expressed body proportions as ratios of sitting height to height and subischial leg length, rather than standard deviation scores for these measurements. Comparable results were obtained when our data for untreated patients were calculated as ratios. In patients treated with oestrogen the ratios were normal.

A larger group of patients with Turner's syndrome should be studied to resolve the discrepancy in the results in body proportions. There is certainly no evidence to suggest that upper-lower segment disproportion is so distinctive as to be a useful index to screen short girls suspected of having Turner's syndrome.^{3,6} The importance of determining the karyotype in a short girl without an obvious cause for growth delay should be re-emphasised.

The support of the Child Growth Foundation is gratefully acknowledged.

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Received 29 January 1986