Clinical Algorithms

Short stature

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Short stature in childhood can usually be explained by familial, perinatal, or social factors, but treatable organic disease may present as short stature, and delay in diagnosis may be dangerous. For example, if treatment of growth hormone deficiency is delayed until the age of 8 years a final adult height within the normal range is unlikely.¹ Infant screening clinics and the first school medical examination are opportune times to check height with simple apparatus and growth charts. A recent survey, however, showed that over half the health authorities in England and Wales did not routinely measure height at the first school medical examination.²

Short stature is defined as a height below the third centile for age on a standard Tanner-Whitehouse chart. About one tenth of these children will be extremely short, with a height of over three standard deviations below the mean for age. They have a more than 50% chance of having organic disease³ and all should be referred for hospital assessment. Population studies in large conurbations have found a high proportion of short children without organic disease living in socially disadvantaged circumstances.⁴ The short child from an affluent area is therefore more likely to have organic disease.

Classification

The common causes of short stature are: (a) familial short stature; (b) intrauterine growth retardation; (c) familial pubertal delay; and (d) psychosocial short stature.

Conditions which may present as short stature (or secondary growth failure) and which are amenable to treatment or other medical management or genetic advice may be classified as follows.

Endocrine—Growth hormone deficiency, hypothyroidism, Cushing's disease.

Gastrointestinal—Coeliac disease, Crohn's disease.

Renal—Chronic renal failure, renal tubular acidosis.

Neurological—Craniopharyngioma.

Respiratory—Asthma.

Genetic—Turner's syndrome.

Orthopaedic—Dyschondroplasias, a large group of conditions causing short limbed short stature, many of them more subtle than classical achondroplasia.

Assessment

History—It is important to discover why the child has presented with short stature. Are the parents or the school worried, or is the

child himself being teased because of his small size? Explanation and reassurance are a large part of the work of growth assessment. Ask about pregnancy and birth history, birth weight, and gestational age. The child who fails to grow as a result of chronic intrauterine growth retardation will usually have been of advanced gestation with a birth weight well below the 10th centile for gestational age. It is becoming recognised that babies of very low birth weight (<1000 g), even if this is normal for gestational age, may fail to attain an adult height in the expected range. Inquire about parental height and measure the parents if present. Look for pointers to organic disease (detailed in the algorithm).

Examination—In the older child assess pubertal staging, with Tanner's method. In a low birth weight child look for dysmorphic features of intrauterine growth retardation as detailed in the algorithm. Some short children show non-specific dysmorphic features. Obesity should be noted. Children with simple obesity are usually tall for age, so the combination of obesity and short stature suggests organic disease.

Measurement—Accurate measurement of height is important for assessing rate of growth. The ideal instrument is the wall fixed Harpenden stadiometer (Holtain, Crosswell, Crymmych, Dyfed). The appropriate Tanner-Whitehouse growth charts showing the -3 SD line are GDB43 and GDG44 (Castlemead Publications, Swains Mill, 4A Crane Mead, Ware SG12 9PY). It is more convenient to measure length in infants less than 2 years old with a Holtain infant measuring table. A simple screening method for younger children, which uses a wall mounted chart as the measuring device, is the Oxford 2-9 growth screening wall chart⁵ (Castlemead Publications). If a standard growth chart is being used the mean parental height centile may be plotted at the right hand side of the chart; 8.5 cm either side of this point shows the centile lines between which a child of those parents would be expected to lie from his genetic background. Thus if a child has tall parents—for example, his father is 187 cm (97th centile) and mother 166 cm (75th centile)—the mean parental height centile is the 90th and he will be shorter than expected if his height lies on the 25th centile. A poor growth rate in a child of 4 years or more may be shown as a rate of less than 5 cm per year using an accurate measuring device or as a falling away from the child's centile line. A child of 2-4 years should be growing at a rate of at least 7 cm a year. A boy from 12 to 14 years with familial pubertal delay may have a growth rate of only 4 cm per year.

References

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