By far the most common cause for referral to a pediatric endocrinology clinic is short stature. These referrals represent only the “tip of the iceberg,” because pediatricians and general practitioners generally care for patients with delayed adolescence or familial short stature without consultation. Endocrine consultation confirms that the majority of patients referred are in these two categories. The growth of children without organic disease tends to parallel the third percentile for height. A few of these children have hypopituitarism or hypothyroidism. Most of them have syndromes in which the common manifestation is short stature, disorders of bone or cartilage, or other conditions for which there is as yet no molecular explanation nor specific therapy. Linear growth rate in children with organic disease generally falls below the third percentile in height.

Children and adolescents often base judgment of each other’s adequacy and acceptability on size; males are also rated on athletic ability. Adult criteria of social status based on other standards (or prejudices) are of less importance to children. Children enjoy patronizing and belittling their smallest age mates just as some adults in subtle fashion enjoy behaving in the same way to their “inferiors.”

Children called “squirt” or “runt” are given various kinds of parental advice. One of the most common (and useless) recommendations is to “ignore it” or “turn the other cheek.” Some children find it effective to say to the tormenter, “You’re too fat” or “Where’d you get all those pimples?” Exceptional children may gain some status by excelling in an area where size is unimportant (such as debating or light-weight wrestling). However, most children are not especially gifted and are simply left out. It is often at this point that medical advice is sought. The parents have sometimes heard of a relative who “received shots when he wasn’t ‘developing,’ and he is now 6 feet tall.” Others have read about human growth hormone (HGH) treatment of hypopituitarism. Parents, patients, and sometimes even the referring physician believe that the child should receive HGH or other medication, and expect the physician to “make him normal.” What is available for short children who have no organic disease?

PSYCHOLOGICAL MANAGEMENT

The method of choice when dealing with the majority of short children is psychological management. Aspects of counseling patients with short stature have been reviewed.1 The natural course of events in untreated, constitutional short stature and delayed adolescence should be discussed with the parents and child. An estimate of final adult height can be made using the predictive tables of Bayley and Pinneau;2 however, these predictions tend to overestimate final height if there is delayed bone age.3 Often the simple reassurance about ultimately normal height is sufficient to satisfy many boys with delayed adolescence.

In a few university centers, psycho-endocrine divisions function in conjunction with the traditional endocrine units. There, patients—and their parents—who have not adjusted to short stature and/or delayed adolescence can be helped to adjust to the problem through counseling. Usually, short stature is only one of several interrelated difficulties which need to be defined and treated. The advantages and disadvantages of growth accelerating or virilizing agents are discussed so the parents and patient can participate in making an informed decision.
about the use of these agents. If "treatment" with a pharmacologic agent is undertaken, it is in conjunction with psychological counseling. The patient and parents are informed from the beginning that the problems uncovered during psychological counseling may require time and effort to deal with.

Expert psychological counseling is not readily available in most centers, and the need for more widespread development of these services is evident. Usually the facilities at hand must suffice.

**BODY BUILDING**

There is a high correlation between nutrition, growth rate, and the time of onset of adolescent development. The underweight child is generally short and slow-growing, and sexual maturation is delayed. Frisch and Revelle have shown a higher correlation between size and maturational events than age. In some instances this correlation should be explained to the child to motivate him to improve himself through appropriate weight gain and muscle development. Children in this age group are not motivated by the parental admonishment, “finish your dinner”; but, they can be greatly helped in body building and the development of special skills by their parents’ willingness to devote 10 to 20 uninterrupted minutes with them daily.

**SYNTHETIC STEROIDS**

Attempts have been made to dissociate androgenic from somatotrophic activity in drug preparations. In some clinical trials oxandrodone and fluoxymesterone have shown acceptable enhancement of linear growth rate without compromising ultimate height. This is because bone age advanced, in general, at an equal pace with height age. Other studies showed a disproportionately greater advance in bone age for oxandrodone and for fluoxymesterone; in these patients the ultimate height is compromised. The conflicting data on these and other anabolic agents were recently reviewed.

At best, these agents merely accelerate the growth rate to enable the child to be somewhat taller, sooner. There is no evidence that ultimate height of children with familial short stature or delayed adolescence is improved.

Judicious use of anabolic agents is acceptable in a few short, prepubertal children who, after careful evaluation, are found to have no organic disease. If endocrine treatment is given, bone age must be monitored at intervals of six months during therapy, and the treatment should be discontinued in patients who show a more rapid advance in skeletal maturation than in height age so ultimate height will not be jeopardized. Disproportionate advancement of bone age can continue even after discontinuation of treatment.

The best response in terms of linear growth rate is usually obtained during the first 12 to 18 months of therapy. Side effects, particularly growth of hair on the upper lip, deepening of voice, and phallic or clitoral hypertrophy, are frequent but not severe. Patients with a good growth response generally prefer to continue therapy despite the side effect(s).

One study of patients with Turner’s syndrome suggested that ultimate height may be improved by treatment with fluoxymesterone. However, growth hormone administration will not improve linear growth rate in Turner’s syndrome. Other organic conditions are under investigation.

**ANDROGEN THERAPY FOR DELAYED ADOLESCENCE IN BOYS**

As short boys get older, their height problem is aggravated by lack of secondary sexual development. In selected patients who desire it, short courses (two to four months) of androgen therapy may be beneficial without adversely affecting ultimate height.

**CONCLUSION**

The common problem of short stature in children who are growing at a normal rate is best managed by clarification of, and attention to, the psychological issues. This may require referral for expert psychological counseling. In a few instances, the physician, parents, and patient may agree that carefully supervised use of one of the synthetic steroids will be made on a short-term basis in an attempt to accelerate growth rate.

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Pediatrics 1974;53;285

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