

The Growth Pattern of Psychotic Boys

By GORDON DUTTON

Kallmann (1953) studied the differences between uniovular twins discordant for schizophrenia and found there to be a definite superiority in physical strength and body weight in the unaffected twin. This paper is concerned with some aspects of the growth of psychotic boys, to determine if the inferiority noted by Kallmann is generally detectable.

MATERIAL

Data have been collected over some years; all the subjects have been patients in hospitals for the mentally handicapped. The survey is confined to boys, and all have been considered psychotic from an early age; all were ineducable, none were capable of making any personal attachments and in most cases behaviour was bizarre in the extreme. They all failed to communicate, although speech was mechanically possible, as evidenced by echolalia in many of the boys.

Twenty-five boys aged 6 to 20 years were examined, but it was not always possible to make a complete examination in every case, as behaviour problems sometimes rendered measurements inaccurate. Even to get a single X-ray of the left hand and wrist, for assessment of the skeletal age, was a major undertaking in many on account of extreme illogical anxiety.

Since many of the patients were first seen the "9 points" outlined by the working party under the chairmanship of Dr. Mildred Creak to study juvenile psychosis, have appeared, (1961) and in retrospect all the patients studied would have fulfilled the diagnostic criteria suggested.

METHODS

Various parameters of growth and development were examined. The methods are those in current use and have been described elsewhere.

1. Full height (Dutton, 1959a).
2. Total body weight (Dutton, 1959b).
3. Skeletal maturity (Dutton, 1959a).
4. Sexual maturity (Tanner, 1962).
5. Discriminant androgyny (Tanner, 1951).

THE RESULTS

Height

The heights of the boys studied were compared with the normal range (P₃ and P₉₇ from Tanner *et al.*, 1959). When the height is expressed as a height quotient (height age/life age × 100) the mean for the group was found to be within the normal range, but 6 boys (26 per cent. of the sample) had a height that was below the third percentile for normal boys.

Weight

Weight is a complex component of growth and is liable to be affected by intercurrent illness, etc., and is therefore not such a reliable guide to abnormal growth as the height, but allowing for these difficulties it is still of some use. The weights of the boys when compared with the normal range showed a larger than normal number with weight below the 3rd percentile, 4 boys being in this group (16.6 per cent. of the sample.)

Comparison of weight for height is of use, since some of the boys might be eating excessively as a method of compensation for their disordered psychiatric state. There is a straight line correlation between height and log weight in normals; when a similar comparison was made in the present series and compared with the line of the normal derived from the 50th percentiles for normal boys taken from Tanner *et al.* (1959), the boys in the present series were grouped around the normal, but 72 per cent. are above the line and 24 per cent. below, which

suggests that they are heavier than the normal for their height.

Skeletal Maturity

The skeletal age, when plotted against the life age and compared with the normal boys from Greulich and Pyle (1959), showed 17 per cent. of the present series with a depression in skeletal maturation below two Standard Deviations from the mean for normal boys. The mean skeletal quotient for the group is however within the normal range.

Sexual Maturity

Normal pubertal changes were found in this series. The youngest age for the onset of puberty was 10·6 years, and the oldest pre-pubertal boy was 12·8 years. Complete sexual maturity had been achieved by one boy by the age of 16·7 years, and one subject aged 20·4 years had not achieved full adult pubic hair development, although full genital development had been acquired. Tanner (1962) gives as the timing of the onset of puberty in boys:

Pubic hair changes	10–15 years
Genital changes	10–14½ years

Completion of sexual development for the average boy is given by the same author as:

Pubic hair	14–18 years
Genitalia	13½–18 years

All the boys, with the exception of the oldest who has a delay in full pubic hair development, fall within the accepted range of the normal.

Discriminant Androgyny

A significant correlation between height and androgyny score ("r"=0·694) was found; similar correlations were found in other non-mongol mentally handicapped males ("r"=0·622) (Dutton, 1962). There is little difference between the present series of psychotic boys and non-mongol mentally handicapped males. The equations for the regression lines are:

Psychotic Boys:

$$\text{Androgyny} = 0.52 \times \text{height in cm.} - 5.4$$

Non-mongol Mentally Handicapped Males:

$$\text{Androgyny} = 0.35 \times \text{height in cm.} - 20.3$$

Since discriminant androgyny is related to sexual maturation it would seem that sexual development is normal in the present series.

DISCUSSION

Childhood schizophrenia is receiving considerable attention at the moment, and various schools of thought have propounded different aetiological theories, but it is probably still fair to say that there is no single aetiological factor operating in all cases. In fact it is almost certain that childhood schizophrenia, like adult schizophrenia, is a heterogeneous collection of disease processes. Stress has however been placed on genetic factors by Bender (1947) and Kallmann and Roth (1956). If genetic causes can be blamed, then presumably there must be a biochemical factor involved if the "one gene one enzyme" theory is believed. If there is a chemical factor operating in these children, then it is quite probable that this will be shown up by an unusual growth pattern since the growth of children and their maturation is a fairly delicate index of physical normality.

The present pilot survey has shown that more psychotic children than expected have a definite growth failure as evidenced by the findings that 26 per cent. have depressed linear growth and 17 per cent. delayed skeletal maturation.

Studies of physical size and development in institutionalized mentally handicapped boys has shown that delays in development are not necessarily produced by institutionalization. Mongols have been shown to have a normal skeletal development even though their height is depressed (Dutton, 1959a). The organically "brain damaged" boy with motor defects, etc., has essentially normal physical growth and development (Dutton, 1959b); in the same paper it was suggested that it is possible to differentiate a specific group of patients by anthropometric means and that the aetiology of this group with depressed growth and physical development is probably an abnormal metabolism. An unpublished series of boys with phenylketonuria also showed a depression of linear growth and skeletal maturation.

The results suggest that it would be worth while to extend the study of psychotic children to include anthropometric surveys, to see if the

TABLE I
Mean Development Quotients in 25 Psychotic Boys

	Height Quotient $\frac{\text{Height Age}}{\text{Life Age}} \times 100$	Weight Quotient $\frac{\text{Weight Age}}{\text{Life Age}} \times 100$	Skeletal Quotient $\frac{\text{Skeletal Age}}{\text{Life Age}} \times 100$
Mean	92.3	99.8	91.8
Standard deviation	13.6	10.0	11.2
Normal range	80-120	80-120	80-120

cases with depressed growth have developed the psychotic illness in spite of a normal environment. These children should be looked at from the genetic aspect and also compared biochemically with psychotic children who have normal growth patterns.

SUMMARY

The results of a survey of the growth patterns in 25 psychotic boys are presented and it is shown that in a proportion of cases there is a failure in linear growth and skeletal maturation, sexual development appearing to be normal.

TABLE II
Abnormal Growth Patterns in 25 Psychotic Boys

	% Abnormal	
Height ..	26	Below P ₃ for normals,
Weight ..	16.6	from Tanner <i>et al.</i> , 1959
Skeletal Maturity ..	17.0	Below 2-SD from normal, from Greulich and Pyle, 1959

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Gordon Dutton, M.D., Consultant Psychiatrist, South Ockendon Hospital, South Ockendon, Romford, Essex