

Some Physical Characteristics of a Group of Psychotic Children

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This report refers to investigations on a group of children in Smith Hospital, Henley-on-Thames (O'Gorman, 1958). Smith Hospital is a long-stay children's psychiatric unit, predominantly for children diagnosed as psychotic and requiring hospital care. In particular, children are admitted where it is thought that the home environment is a factor in the maintenance of the child's psychosis or where the child's disturbance is such that the parents are no longer able to cope with it.

Psychosis in childhood has been observed and described in a variety of conditions associated with profound abnormalities in the central nervous system. Earl's (1934) description of "The Primitive Catatonic Psychosis of Idiocy" remains a classic in this field. Critchley and Earl (1932) drew attention to the high incidence of psychosis amongst patients suffering from tuberous sclerosis. Psychosis in mongols has been described by Rollin (1946) and psychotic features are frequent in untreated cases of phenylketonuria. The role of environmental factors in the production of psychosis in these cases is generally considered secondary to the gross impairment of cerebral function brought about by these disease processes.

Bourne (1955) described a group of children in whom "extreme mental defect may be attributable to grossly perverted infant rearing" and he thought that in his series the 10 per cent of cases "without evident organic cause" had resulted from such experiences. O'Gorman (1954) also drew attention to childhood psychosis as a cause of mental defect in a group of patients in a mental deficiency hospital. These two authors and many others regard environmental factors, and in particular the failure of the mother-child relationship, as the primary ones in the aetiology of some forms of psychosis. They emphasize the absence of a

history or signs suggestive of any physical abnormality in their group of cases.

Goldfarb (1961) has sought to distinguish "organic" from "non-organic" cases, by the presence or absence of certain "soft" neurological signs. The general validity of these "soft signs" has yet to be confirmed and in any event their relationship to the psychosis has yet to be established. Creak (1963) reported three cases, two of whom were thought at one time to be schizophrenic but were finally shown at autopsy to be cases of neurolipidosis. The third case diagnosed as tuberous sclerosis could "for a brief period only . . . have been mistaken for an autistic child". We have, therefore, in this study not divided our group into "organic" and "non-organic", but have stated the relevant facts so far known to us. Furthermore, we have made no attempt to differentiate between the various terms which have been used to describe this condition such as autism, childhood schizophrenia, schizophrenic syndrome, etc. as we are not aware of any clear diagnostic criteria in use at present which validate such differentiation.

MATERIAL

The total in-patient population of Smith Hospital, 44 patients, was assessed by one of us (G.S.) in terms of the 9 diagnostic criteria for schizophrenic syndrome in childhood put forward by Creak *et al.* (1961). The 34 children (22 males, 12 females, aged 2 years 4 months to 14 years 9 months, mean = 7 years 11 months), who showed the characteristics described in point one and in at least two of the remaining eight points are included in this investigation. A characteristic was counted as present if the child had at any time displayed it. Every child showed at least four of these features, the average number being six. The number of

children showing the features described in each of the nine points was as follows:

1. Gross and sustained impairment of emotional relationships with people 34
2. Apparent unawareness of his own personal identity to a degree inappropriate to his age 21
3. Pathological preoccupation with particular objects 15
4. Sustained resistance to change in the environment and a striving to maintain or restore sameness 15
5. Abnormal perceptual experience (in the absence of discernible organic abnormality) 30
6. Acute, excessive and seemingly illogical anxiety 19
7. Speech may have been lost or never acquired, or may have failed to develop beyond a level appropriate to an earlier stage 34
8. Distortion in motility patterns .. 32
9. A background of serious retardation in which islets of normal, near normal, or exceptional intellectual function or skill may appear 17

Six of these children have histories and physical signs suggestive of organic lesions and three others suffer from epilepsy.

The children were assessed on the Vineland Social Maturity Scale, which has been used in spite of its limitations because it does not require the co-operation of the child. The results are given in Table I.

TABLE I

Vineland Social Maturity Quotient	Number of Psychotic Children
<20	4
20-49	22
50-79	7
80-90	1
Mean 38.3	Total 34

The records show a good deal of scatter. Many of the children are more retarded in

certain areas,* the majority in the sphere of communication, and more advanced in others, most commonly self-help, than their overall scores indicate.

Consideration of birth order and maternal age at birth of patient revealed nothing significant.

The social class of the parents based on the father's occupation (Registrar-General's Classification of Occupation, 1951) was as follows: Classes I and II, 19; Class III, 12; Classes IV and V, 3.

INVESTIGATIONS

Physical Measurements

The following measurements were taken on each child: height, weight, three subcutaneous fat measurements (triceps, subscapular and supra-iliac skinfold), two bone measurements (lower ends of humerus and femur), two muscle measurements (biceps and calf). For measurements of subcutaneous fat the Harpenden calipers were used. For other measurements the method suggested by Tanner and Whitehouse (1959) was employed.

Percentile ratings were taken from standard tables for age and sex by Tanner and Whitehouse (1959 and 1962a) for height, weight, triceps and subscapular skinfold, and from tables supplied by Dr. R. W. Parnell for total fat (i.e. the sum of triceps, subscapular and supra-iliac skinfold measurements on the Harpenden scale), and for humerus, femur, biceps and calf measurements. The distribution of the psychotic children for each of these measurements and that of the normal population are shown in Table II.

There is a significant difference between the distribution of psychotic children above and below the 50th percentile and the normal distribution for measurements of weight and biceps ($\chi^2=6.5$ and 9.634 ; $p=.02$ and between $.01$ and $.001$, Yates Correction). We feel that the biceps measurement may be unreliable because of the difficulty of ensuring

* Areas or categories of behaviour covered by this test are: self-help (general, dressing and eating); self-direction; communication; socialization; locomotion and occupation.

TABLE II

Percentile Range	Ex-pected Distribution N=34	Psychotic Group				Ex-pected Distribution N=30	Psychotic Group			
		Height N=34	Weight N=34	Fat			Bone		Muscle	
				Triceps N=34	scapular N=34		Humerus N=30*	Femur N=30*	Biceps N=30*	Calf N=30*
>97 ..	1.0	0	0	0	0	4	1	0	3	
90-97 ..	2.4	1	1	0	4	1	0	0	0	
75-89 ..	5.1	5	4	2	9	3	5	0	2	
50-74 ..	8.5	9	4	9	4	6	12	6	10	
25-49 ..	8.5	6	8	13	11	7	7	10	8	
10-24 ..	5.1	4	9	5	4	6	3	7	5	
3-9 ..	2.4	6	4	1	1	2	1	4	0	
<3 ..	1.0	3	4	4	1	1	1	3	2	

* Four children under five years of age omitted, as we are not aware of standards for this age group.

that these children contract their biceps fully. If the biceps were not fully contracted, this might explain the results. There are no significant differences in the distribution above and below the 50th percentile for any of the other measurements. With respect to height, however, there is an excess of children falling below the 10th percentile ($\chi^2=8.5$, p between .01 and .001, Yates Correction).

In Goldfarb's (1961) group, there is no significant deviation from the normal for height and weight, but his group is not comparable with our own by virtue of differences in age, intelligence and specific social selection criteria.

Skeletal Age

This was initially assessed by two radiologists using the method of Greulich and Pyle (1959). Skeletal maturation scores were later allocated and percentile rankings obtained by one of us (G.S.) by the method described by Tanner and Whitehouse (1962). The results are shown in Table III.

Our group of psychotic children are shown to be significantly retarded in bone age

TABLE III

Percentile Range	Expected Distribution	Psychotic Group (N=32)
>90 ..	3.2	0
75-89 ..	4.8	1
50-74 ..	8	7
25-49 ..	8	5
10-24 ..	4.8	6
<10 ..	3.2	13

($\chi^2=22.2$, $p<.001$, dividing the table at the 75th and 25th percentile as shown). It will be seen that 19 of the 32 children fall below the 25th percentile, and that 13 of them are below the 10th percentile. In eleven of the children falling below the 10th percentile, there has been no previous evidence of any organic factor.

Careful observation of the feeding habits of these children and analysis of their diet do not indicate a nutritional deficiency. Explanation on the grounds of lower social class origin is also not tenable, as less than 10 per cent. of this group come from social classes IV and V.

Furthermore, rank order correlation between length of stay in hospital and degree of skeletal retardation shows that there is no association between these two factors.

DISCUSSION

Bender (1956) suggested that childhood schizophrenia may be "a maturational lag at the embryonic level". Fish (1957) reported an association between childhood schizophrenia and signs of physical immaturity with uneven development in many areas including body growth. It is generally accepted that children diagnosed as psychotic are also apparently mentally retarded, and this is in fact a part of the ninth point in the criteria used. In this investigation there is evidence of retardation in height, weight and bone age measurements. Our findings suggest also that the advent of more sensitive or sophisticated methods of investigation may indeed increase the proportion of cases in whom some organic pathology is demonstrable. The mechanism of production of psychotic features, however, is not clearly understood, and to assume a causative connection with physical retardation, as yet shown in some children and in some spheres only, would not be justified. It does, however, indicate the necessity for more detailed physical investigation of psychotic children, and this must necessarily include a complete study of endocrine function.

SUMMARY

Certain physical characteristics of a group of 34 psychotic children are compared with the

standards for normal children. The psychotic group were found to be significantly below their normal peers in weight, and bone age, and to include an excess of children below the 10th percentile for height.

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