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Identical Triplets with Asperger's Syndrome

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Summary: The case histories are presented of three 17 year old identical male triplets with Asperger's syndrome. They show the impairments affecting social interaction, non-verbal communication and imagination, the motor clumsiness, and the circumscribed interests characteristic of that condition. They also have some features in their history and present behaviour more typical of childhood autism. Despite marked overall similarities, the three differ in the severity with which their problems are manifested. A relationship can be found between the amount of peri- and post-natal trauma, degree of intellectual impairment and number of autistic features. The findings support the hypothesis that autism and Asperger's syndrome are on the same continuum of pathology.

In 1944 Asperger published his first account of the syndrome, now known by his name, which he referred to as 'autistic psychopathy', though he insisted that it was different from Kanner's early childhood autism (Kanner, 1943). Further descriptions of Asperger's syndrome have since been given by Bosch (1962), Van Krevelen (1971), Van Krevelen and Kuipers (1962), Wing (1981) and Wolff and Barlow (1979). The major clinical features include lack of empathy; naive, inappropriate, one sided social interaction and little or no ability to form friendships; pedantic, repetitive speech; poor non-verbal communication; intense absorption in certain subjects such as astronomy or railway time tables, but marked limitation of imaginative activities; clumsy and ill co-ordinated movements and odd posture. The prevalence of the typical syndrome is unknown. Boys are considerably more likely to be affected than girls, and Asperger at first thought it was confined to males. In their clinic-based samples, Wolff and Barlow found a ratio of 9 to 1, and Wing a ratio of 4 to 1 males to females.

Mnukhin and Isaev (1975) suggested that the abnormal behaviour was due to "an organic deficiency of brain function". Nearly half of the cases seen by Wing had a history of pre-, peri- or post-natal conditions that might have caused cerebral damage. Asperger himself considered the syndrome to be genetically transmitted, usually from father to son. Wing reported that 5 out of 16 fathers and 2 out of 24 mothers who were seen had, in milder degree, some of the characteristics of their affected children. However, this conclusion was based on clinical impressions, not formal assessment.

There have been no systematic studies of the genetics of Asperger's syndrome, and no published reports of its occurrence in twins or triplets. The present authors know of one set of concordant identical twin brothers (Tantam – personal communication). However, some workers (Bosch, 1962; Wing, 1981) regard the syndrome as on a continuum with early childhood autism. Folstein and Rutter (1977) from their study of 21 twin pairs suggested that inherited factors play a part in some cases of autism, though the exact mechanism remains obscure. Gillberg (1983) has described a set of male triplets with classic autism, severe mental retardation and the fragile X chromosome abnormality (Mattei *et al*, 1981). It seems likely that, as with classic autism, a variety of gross causes, genetic or environmental, which lead to brain dysfunction may be implicated in Asperger's syndrome.

The present paper comprises a case study of identical male triplets concordant for Asperger's syndrome. The clinical pictures and the similarities and differences between the brothers are of interest because of the questions they raise concerning aetiology, association of overt behaviour with brain dysfunction, and the relationship between Asperger's syndrome and early childhood autism.

Case Report

Family history

Both parents, Mr and Mrs T., came to this country from the Caribbean as young adults and both are now in their forties. Mr. T. is a skilled manual worker. Both are sociable, with a circle of friends, and no history of

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psychiatric illness. Neither has any of the abnormal behaviours shown by the triplets, nor is there any family history of such problems on either the maternal or paternal side. Both Mr and Mrs T. have twin siblings, the father's being dizygotic (of opposite sex) but the zygosity of the mother's twin brothers is unknown.

Mrs T. has 5 boys, one aged 25, one 18 and the triplets aged 17 years. The two older sons are sociable and have no behaviour problems. The parents have not lived together since the birth of the triplets, but they keep in friendly contact.

Early history

The three boys were born in the UK in 1965. Mrs T., then aged 26, experienced a period of severe emotional stress during pregnancy. She had hypochromic anaemia and loss of weight in the last trimester and was admitted to hospital for the last month.

All three were breech deliveries. In birth order, William weighed 3 lbs 11 oz (1.67 kg) Roger 4 lbs 6 oz (1.99 kg) and Bernard 4 lbs 2 oz (1.87 kg). William was slightly cyanosed and required oxygen. They were placed in incubators, with William remaining the longest (4½ weeks). No biochemical investigations were recorded in the notes. At about 1 year of age William had pneumonia and was in hospital for almost a month. Apart fom these early problems the boys were physically healthy. They were not separated from their mother during childhood. They were undemanding as babies, being content to lie quietly in their cots or perambulator. William was the least responsive to social approaches and Mrs T. described him as 'rather peevish'. Toilet training was completed early, but the three were slow in walking and did not begin to speak until after 2 years, William being the slowest. However, Mrs T. did not worry about them at this stage as, with four toddlers on her hands, she was relieved that the triplets wanted little attention.

At 5 years they were enrolled at the local infants school, but did not progress well. They were transferred to an ESN (M) school which they still attend. During the early years, William was reluctant to leave home to go to school and often cried and stayed close to his mother. No psychiatric referral was made until they were aged 13, when William was seen because of temper tantrums at school. All three were eventually seen by a clinical psychologist (one of the present authors, E.B.) who diagnosed Asperger's syndrome.

Present behaviour pattern

Mrs T. was interviewed concerning each of the triplets, using the Medical Research Council's Handicaps Behaviour and Skills (HBS) schedule (Wing and Gould, 1978). This was designed for use with mentally

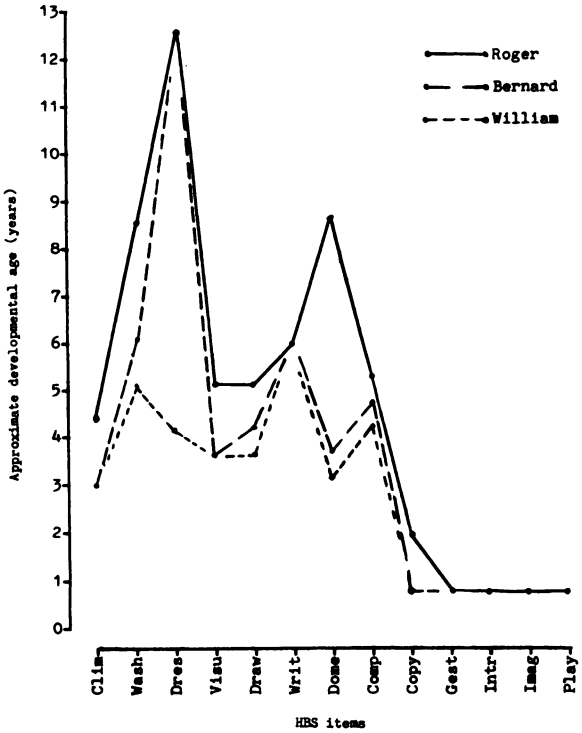


FIG.—Developmental profiles of items selected from the HBS schedule

Key: Clim = Climbing stairs etc; Wash = Washing; Dres = Dressing; Visu = Visuo-spatial skills; Draw = Drawing; Writ = Writing; Dome = Domestic work; Comp = Comprehension of speech; Copy = Copying gesture; Gest = Using gesture; Intr = Sharing interests; Imag = Imaginative activities; Play = Social play;

retarded children and adults and those with autism or related conditions. It elicits, systematically, clinical information in order to make a diagnosis and an assessment of the level of development and any behavioural abnormalities. Profiles comprising various developmental skills, selected as examples from the HBS, are shown in the Fig. This illustrates the wide discrepancies between different areas of development, and the severe impairments in non-verbal communication, imagination and social play. It also shows that the brothers have similar profiles but some differences in their levels of function, with William being the most and Roger the least handicapped. They resemble each other in their patterns of ratings for behavioural abnormalities, but there are differences of detail. The triplets are socially isolated, have never made friends and are the victims of much teasing at school. Each is jealous if the others receive extra attention, but they are not overtly affectionate to each other, or to their

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mother, who is devoted to them. All three avoid eye contact. William is the most aloof and dislikes physical proximity to others. If pushed into social interaction, he has a temper tantrum. Roger is the most sociable. He is the only one to go on school outings, and passively accepts social approaches.

After a slow start, all three now have good grammar and a repertoire of long words. Their speech is curiously pendantic, limited in content and repetitive. They do not use gestures or facial expressions to convey meaning or emotions, apart from anger. Their vocal intonation is jerky and odd, William having the most abnormal speech delivery of the three.

The boys have never had imaginative play, nor shown any curiosity about the world. Their activities are almost entirely repetitive. In their early years, they had toy cars which they arranged in long straight lines, disturbance of which resulted in screams. Now they collect books, especially works of reference containing lists. Roger and Bernard also like science fiction, while William prefers books on horse racing. They can read, but they have virtually no comprehension of the meaning. They spend long hours copying the contents of their books, for no purpose other than indulging in the repetitive activity of writing and storing the filled exercise books. Some idea of the odd nature of their circumscribed interests and their style of speech is given by the following brief conversation. William was offered three old directories with covers of different colours. He studied them long and carefully and then asked, "Are these government publications?". On being told they were he said; "Then I wish to opt for the blue one". None of the rest of the family owns or borrows books. Roger also repetitively draws cars, Bernard draws squares, but William does not draw at all. All three have tended, since early childhood, to rock while sitting. William carries a piece of cloth which he frequently sucks.

They appear ill-coordinated in gait, are poor at games, odd in posture, and are afraid of climbing. They jump and flap their arms when excited or angry. William is the most clumsy and also has problems with fine movements.

All three are afraid of dogs. Apart from this, and occasional brief displays of temper, Roger and Bernard appear calm and equable in temperament. William, on the other hand, is often unhappy and says to his mother "Why am I so miserable?" He is the most difficult of the three, being sensitive to the slightest criticism. He responds to any suggestion by saying "I don't like it. I don't want it". He has the most temper tantrums and has broken windows when angry, which led to the psychiatric referral. He takes objects that he wants to possess, such as books, in full view of the owner, and appears to have no concept of stealing.

Special Investigations

Medical examination

They wear spectacles to correct myopia, otherwise no physical abnormalities have been identified apart from their clumsiness and odd gait and posture. In the absence of epileptic fits or signs of gross disorder of the central nerous system, it was not considered appropriate on clinical grounds nor helpful to the triplets to undertake special investigations such as EEG, Skull X-ray or CAT scan.

Psychological tests

The results of the testing are shown in the Table.

On the Wechsler Intelligence Scale for Children (WISC), Bernard and Roger were in the normal range of intelligence and William was at the upper end of the mildly retarded range. The overall scores on the verbal and performance scales were similar. Among the verbal sub-tests, the comprehension scores were the lowest, the discrepancies between these and the highest scores being outside the range expected in normal children (see Table I footnote). For the performance sub-tests, the scores for coding were poor because of lack of understanding that speed was necessary.

TABLE

Results of psychological tests
(Completed between age 16–17 years)

WISC-Revised	William	Bernard	Roger
Full scale intelligence quotient	67	80	90
Verbal intelligence quotient	72	82	92
Performance intelligence quotient	67	81	90
Verbal sub-tests (scaled scores)			
Information	8	10	11
Similarities	7	7	9
Arithmetic	4	6	10
Vocabulary	5	9	11
Comprehension	4	4	3
Performance sub-tests (scaled scores)			
Picture completion	7	8	10
Picture arrangement	6	7	10
Block design	4	7	9
Object assembly	6	9	9
Coding	3	5	5
Vineland Social Quotient	33	34	46

Footnote A discrepancy of more than 3 points between any pair of sub-tests is considered significantly abnormal at the 15% level of confidence (Wechsler, 1974).

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The Vineland social quotients were in the severely retarded range, and considerably lower than the intelligence quotients on the WISC.

In general, William had the poorest scores and Roger the best.

When shown pictures of scenes with people in them, the boys gave concrete descriptions of the contents, but could not discuss the emotions possibly felt by the characters depicted.

Examination of chromosomes

No fragile X chromosomes were seen in the blood samples, nor were any other specific abnormalities detected.

Zygosity

The three brothers are remarkably alike in appearance, especially Roger and Bernard, whom even their mother sometimes confused when they were younger. William is identifiable when seen with his brothers only because he is slightly shorter, his posture is a little more odd and the shape of his lower lip appears to have been affected by his habit of sucking a piece of cloth. The triplets and their parents were tested for red blood cell types and the probability of non-monozygosity calculated using the method described by Emery (1976). The probability that the triplets are not monozygous is less than 0.0025.

Discussion

The triplets all show the major behavioural features described by Asperger, outlined in the introduction to this paper, and this syndrome is the most appropriate diagnosis.

The pattern seen in the psychological assessments is consistent with the clinical findings. (There are as yet, insufficient data to say if there is a test profile that is characteristic of Asperger's syndrome). The discrepancies between the intelligence and social quotients underline the problems the triplets have in applying intellectual skills to social and practical situations. This was particularly obvious in the comprehension sub-test, on which their scores were low. They understood the meaning of the questions, but were unable to use their knowledge to work out commonsense solutions to the problems posed. The sub-test also demonstrated the immature level of development of their concepts of social and moral conventions. They achieved higher scores on sub-tests such as information by drawing on the facts they had learnt by rote. On the coding test they were completely accurate, but had no regard for the tester's verbal and non-verbal encouragement to work fast. Block design, another timed test, was also approached in the same precise, but ponderous way. The scores on this test were not discrepant from most of the other performance sub-tests, unlike some people with Asperger's syndrome or classic autism who perform particularly well on block design (Lockyer and Rutter, 1969).

However, some details of the history and clinical picture are more typical of classic early childhood autism. These are the insistence in the early years on lining up toy cars, the fact that they walked before they talked (Asperger stated that those with his syndrome acquire speech before mobility), and the jumping and arm flapping. The concurrence of features of both syndromes in the same person has been described elsewhere (Bosch, 1962; Wing, 1981) and is evidence in favour of the theory that they are closely related. In any case, repetitive behaviour, inability to form peer relationships, limitation of imaginative play and poverty of non-verbal communication are diagnostic features of both conditions.

Despite a marked overall similarity between the triplets, there are differences of detail which also have a bearing on the relationship of Asperger's syndrome and autism. William, the brother with the most peri- and post-natal problems, and the lowest IQ and social quotient, shows the most features of the latter. He is the most aloof, actively dislikes physical contact, is the most negative and resistant to change, the most difficult in behaviour, still carries a cloth to suck, and is the most oblivious of the rules of social conduct. On the other hand, Roger with the fewest peri-natal problems is the most able and comparatively the most sociable. These findings suggest a continuum of severity of brain pathology, with Asperger's syndrome towards the milder end and more typical autism towards the more severe end of the spectrum. This idea is compatible with Van Krevelen's (1971) theory that childhood autism results when peri-natal brain damage occurs in a child who would otherwise have had Asperger's syndrome. The clinical data suggest that this is too simple a view, but it probably contains an element of truth.

The differences between the three, which were observed from birth, cannot be ascribed to the emotional environment in which they were reared. Mrs T. has always been closely and warmly involved with them all, but has a special concern for William because of his extra vulnerability. They were brought up in a single parent household, but this is common in the sub-culture to which they belong, and Mrs T. has coped more than adequately with her whole family.

It is tempting to suggest a genetic cause for the behavioural syndrome in the triplets, but this remains uncertain, especially since the parents report no history of any behaviour suggestive of Asperger's syndrome among their relations, and the older brothers are both normal. The boys could have been

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affected by some intra-uterine pathology, or as a consequence of the peri-natal difficulties. If the basic aetiology was genetic, some additional pre-, peri, or post-natal influence was necessary to produce the differences in cognitive level and behaviour pattern between the three.

Conclusions

This case study does not resolve the question of a genetic aetiology of Asperger's syndrome, but it does suggest that brain damage before, during or after birth, even if not the primary cause, affects the way the condition is manifested. The findings in the triplets support the hypothesis that such damage is related to the degree of severity of the social and cognitive impairments and these in turn influence the overt behaviour. Finally, the differences between the triplets are compatible with the view that Asperger's syndrome and early childhood autism are on the same continuum of pathology.

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