Current Practice

CHILD CARE IN GENERAL PRACTICE

Reading and Writing Difficulties in Childhood

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Recent studies have shown that a significant proportion of the child population has difficulties in learning to read and write. In an investigation carried out by secondary-school teachers in Scotland 40% of children in selected schools were found to be three or more years retarded in reading at an average age of 13 years 9 months. The serious effects of reading difficulties on later education have been well recognized for many years (Schonell, 1948; Vernon, 1957). There is still, however, a considerable disagreement about the relative importance of different causes of slowness in learning to read and write. This article is concerned with those causes which may be constitutional or environmental, or a combination of the two, and with the ways in which children having difficulties in learning to read and write may present to the doctor rather than to the teacher.

Recognition

In ideal conditions teachers would recognize early those pupils who were not making the expected progress in learning to read and write. The expectation would be assessed in terms primarily of the intellectual capacity of the child as measured by a reliable individual test of intelligence. In present conditions, however, there are too many children in each class and reliable assessments of intelligence are seldom available, so that the position is reversed—teachers tend to judge the intelligence of a pupil by his progress in reading. Thus special learning difficulties may escape recognition for years.

Delay in referral may cause some children to develop symptoms which may bring them to medical attention. Persistent failure in school may produce a stress situation in which the child develops severe secondary anxiety, and a variety of symptoms of emotional disturbance may appear. These vary from temper tantrums to night terrors, from enuresis to solitariness, and from truanting to pilfering (Ingram and Reid, 1956). While the evidence from the psychological literature (Lynn, 1957) suggests that some anxiety may actually promote the learning of reading—though it may lower the achievement in arithmetic (Lynn, 1957; Wechsler, 1958)—it is clear that excessive anxiety will disrupt all learning.

Diagnosis

Since the causes of reading and writing difficulties in childhood are so diverse, the investigation of the individual patient must be thorough. Assessment is usually best carried out in the local education authority child guidance clinic, where medical, psychological, educational, and social appraisals can be made.

Medical Aspects

Medical studies should include a detailed family history, for specific reading difficulties are often familial. The birth and neonatal history should be noted, for it is known that educational difficulties occur frequently as the presenting symptoms of underlying brain damage. A developmental history may give an indication of retardation of motor, linguistic, adaptive, or social behaviour that is attributable to mental retardation, or of retardation in, for example, speech development, which might or might not be secondary to hearing loss. A history of frequent absences from school may be important. If the child has developed seizures or if his behaviour has altered after some infectious illness it may be an indication that an encephalopathic illness has occurred, or that there is underlying brain damage. An account of the child's general behaviour will often reveal symptoms of anxiety which, whether or not they are secondary to difficulties at school, are of importance.

The physical examination should include a careful neurological study, special attention being paid to any abnormalities of speech, hearing, vision, and manual dexterity. Signs of minimal cerebral dysfunction should be sought. Recent experience has shown that children suffering from mild ataxia and the choreoid syndrome (mild dyskinesia manifest as instability of posture and small involuntary movements) are not infrequently first seen because of learning difficulties. The laterality of hand, eye, and foot should be tested, for many children with specific dyslexia show weak lateralization of hand and foot, and a rather high proportion are left eyed.

During the examination the child will often give evidence of anxiety or emotional instability, which, however, will usually have been suspected on the basis of the full history already obtained.

Psychometric Assessment

The psychologist will obtain a detailed account of the child's school progress, the methods of teaching used, and his reactions to the school situation.

The formal psychological assessment should comprise standardized tests of intelligence and of educational attainment in reading, spelling, and arithmetic. From these tests mental and educational ages (or alternatively intelligence and educational quotients) will be derived.

In general these ages (or quotients) should be approximately the same. Thus a "bright" child is likely to have a reading age higher than his chronological age, whereas a "dull" one's chronological age will usually exceed his reading age. A child may be having difficulty with reading simply because he is expected to keep up with children of his own chronological

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age but of higher mental age. This is particularly apt to occur in the upper socio-economic groups.

The administration of a series of diagnostic reading tests to a younger patient will enable the psychologist to determine the nature of his disability or disabilities. With older children who have largely mastered the mechanics of reading, tests in silent reading are the most accurate way of measuring reading achievement, while spelling tests will indicate best the type of difficulty experienced.

Broadly speaking, weaknesses may exist in one or both of two spheres—the visuo-spatial and the auditory-phonetic. Thus the child who suffers from inadequacy in the former may be unable to recognize even the most commonly occurring words or may be unable to discriminate between words closely resembling each other in shape. He may also reverse letters—for example, reading b for d, p for q, and so on—or transpose letters within words. The child suffering from the second type of disability has difficulty in synthesizing letters correctly sounded into words, in the most extreme cases producing a word bearing no similarity to the letter sounds. In spelling he cannot discriminate between the different vowels and consonants which sound similar.

Constitutional Causes

Mental Retardation

It is evident that the child with subnormal intelligence will learn to read late and slowly if at all, for, as implied above, reading attainment will usually be roughly commensurate with general learning ability. Inquiry will usually elicit the fact that progress is slow in all subjects.

Brain Damage

Many children suffering from brain damage have a limited attention span and find concentration for more than a few seconds at a time impossible. In its most extreme form this lack of attention and distractibility is found as the hyperkinetic syndrome in which there is a compulsive drive to approach and touch any new stimulus presented, marked restlessness and impulsiveness, and an inability to accept discipline. Such behaviour may make normal schooling quite impossible.

Occasionally a child will be found with frequent mild epileptic attacks involving slight impairment of consciousness in whom marked improvement can be obtained if the seizures are controlled. As often as not, however, any attempt to control seizures results in complaints from teachers about the anti-convulsant medication which has been prescribed, because it makes the child drowsy, inattentive, or restless in class.

Another important effect of brain damage is to cause actual perceptual difficulties, well shown in the difficulty in distinguishing picture from ground and in discriminating and sorting shapes and patterns which children with cerebral palsy demonstrate when they are tested. A proportion have difficulties similar to those found in children who suffer from specific dyslexia. They cannot identify correctly or orientate written symbols. Patients with ataxia, for example, may have very considerable difficulty in recognizing shapes and patterns, and, therefore, in reading written symbols correctly.

A proportion of patients with brain damage have difficulties in visual fixation and suffer from visual-field defects. However, such abnormalities if severe are usually recognized before the child reaches school age, though one does occasionally come across a child who has been at school for a year or two without quite severe myopia being recognized.

Specific Dyslexia and Dysgraphia

Specific (or developmental—see Critchley, 1964) dyslexia is the name given to the difficulty encountered by a proportion of apparently healthy children of average or superior intelligence in learning to read. Invariably such children also have difficulty in learning to write connected prose. A difference of at least two years between mental age and reading age has been arbitrarily taken as indicating dyslexia.

It seems certain that a proportion of cases, in spite of the absence of gross signs of brain damage, are in fact suffering from the effects of perinatal or later brain injury, but in others the reading difficulties appear to be genetically determined (Hallgren, 1950). All studies show that backward readers in general are much more frequently boys than girls (Vernon, 1957; Lovell *et al.*, 1964). Sufferers from specific dyslexia show this sex incidence strongly (Ingram and Reid, 1956). They tend to come from families in which there is a history of reading difficulty, of poor lateralization of handedness, and of twinning. About half the patients have a history of slow speech development but otherwise their development has proceeded normally. On examination it is found that about half show weak lateralization of handedness and footedness, and that about half are left eyed. Many have difficulties in imitating hand postures, and some show directional confusion in other activities than reading or writing in test situations.

Slow speech development contributes to slowness in learning to read and write in many patients because it is frequently associated with poor auditory memory, which in reading causes difficulties in synthesizing words from their component speech sounds, and with inadequate powers of auditory discrimination and analysis, which produce letter confusion and difficulties in breaking the words down into their component sounds when writing. When the retardation of speech development is severe there may be associated difficulties of dysphasic type. The child may have an inadequate vocabulary to express his ideas and commonly has a marked tendency in reading and writing to omit or confuse small words of predominantly syntactical significance, such as conjunctions, auxiliary verbs, articles, and prepositions.

In addition, however, there is a known association between some instances of slow speech development and specific reading disability in which the patient's predominant difficulties may be in recognizing and reproducing the written symbol.

In patients with no history of slow speech development visuo-spatial difficulties are usually more evident than auditory phonetic difficulties.

Because children suffering from specific or developmental dyslexia and dysgraphia may be of average or superior intelligence (Lovell *et al.*, 1964) their reading and writing difficulties are often attributed to laziness, inattention, or emotional maladjustment. If they are of very high intelligence their difficulties may escape notice, as they may be able to scrape along at the level of their chronological age group.

Environmental Causes

The child's environment can contribute to his backwardness in reading and writing in a number of ways, which include frequent absences from school, repeated changes of school or teacher, overcrowded classes in primary school, and lack of encouragement at home. This last factor is most likely to be present when the child is from a family in the lower socio-economic groups. We have treated more summarily this class of causes, for they relate to the social rather than to the medical or psychological field and are mostly susceptible to eradication by obvious social measures, though they are often very difficult to deal with in practice.

Management

There are too many causes of reading and writing difficulties to consider the management of them all in this article. Clearly, specific causal factors must be treated.

In the majority of cases difficulties are not severe and the teacher (or an adjustment teacher if the school is fortunate enough to have one) can give appropriate help. Where they persist, however, as in specific dyslexia, a fuller specialist investigation as described above is indicated. This should be sought early rather than late, for, to be most effective, remedial teaching, changes of environment, or the correction of visual or hearing defects should be organized as soon as possible.

While the type of remedial help that is given depends to a large extent on the nature of the child's difficulties and is outside the scope of this article, it may be categorically stated that any form of educational pressure should be removed in order that secondary anxiety may be prevented or reduced.

Fortunately, children with specific reading and writing difficulties (specific dyslexia) constitute a small proportion of backward readers. However, they present a special educational problem, as they are likely to require individual help for many years. Some of them are highly intelligent and it is important that their learning of other subjects should not be impeded by their reading disability. Some local authorities (Edinburgh and Aberdeen, for example) make special provision for them.

There is an urgent need for all authorities to do so if these children are to avoid personal frustration and are to contribute their full potential to the community.¹

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¹ The Spastics Society, 38 Newcomen Street, Guy's Hospital, London S.E.1, and the Invalid Children's Aid Association, 4 Palace Gate, London W.8, are willing to advise, but in the majority of cases when teachers are made aware of the possibility of specific dyslexia they will refer children for further investigation to local educational psychologists.

REFERENCES

- Critchley, M. (1964). *Developmental Dyslexia*. Heinemann, London.
Hallgren, B. (1950). *Acta psychiat. scand.*, Suppl. No. 65.
Ingram, T. T. S., and Reid, J. F. (1956). *Arch. Dis. Childh.*, **31**, 161.
Lovell, K., Shapton, D., and Warren, N. S. (1964). *Brit. J. educ. Psychol.*, **34**, 58.
Lynn, R. (1957). *Ibid.*, **27**, 62.
Schonell, F. J. (1948). *Backwardness in the Basic Subjects*, 4th ed. Oliver and Boyd, Edinburgh and London.
Vernon, M. D. (1957). *Backwardness in Reading*. Cambridge University Press, Cambridge.
Wechsler, D. (1958). *Measurement and Appraisal of Adult Intelligence*, 4th ed. Williams and Wilkins, Baltimore.

Adverse Reactions to Drugs

The Committee on Safety of Drugs have circulated to all doctors and dentists in the United Kingdom two further pamphlets in their Adverse Reactions Series. The first pamphlet was summarized in the *B.M.J.* of 29 February 1964, p. 573.

Pamphlet No. 2 gives a brief description of the workings of the Committee's "early warning system," which is based on reports of adverse reactions sent in on yellow cards by doctors and dentists. The rate of reporting suspected adverse reactions to the Committee has varied from fewer than 150 per month to over 800 a month. Over 3,000 reports have now been received. It is emphasized that the determination of frequency of adverse reactions to a drug remains difficult, since all that can be done is to relate the number of reactions reported to the total amount of that drug prescribed or sold. Since many cases are probably not reported to the Committee, present assessments are likely to be an underestimate. Special

arrangements for monitoring selected drugs in hospitals are now being introduced.

Report No. 3 draws attention to adverse reactions to five drugs. Three of these, phenylbutazone, oxyphenbutazone, and nifedazone, are chemically related to amidopyrine and appear to share its tendency to damage the bone marrow (*Brit. med. J.*, 8 May 1965, p. 1205). Since early in 1964, 50 cases of serious complications with 18 deaths have been reported in patients treated with phenylbutazone. There were 16 comparable reports with five deaths in patients treated with oxyphenbutazone and four reports of serious complications, none fatal, in which nifedazone was involved. There were five cases of liver damage and nine cases of peptic ulceration suspected to be due to phenylbutazone or oxyphenbutazone. There were 52 patients who developed blood dyscrasias while on treatment with these drugs.

In 1964 the estimated number of National Health Service prescriptions from general

practitioners was 2,600,000 for phenylbutazone, 510,000 for oxyphenbutazone, and 45,000 for nifedazone. While there were only four cases of blood dyscrasias reported in patients on treatment with nifedazone, this small number may simply reflect the much smaller number of prescriptions.

Indomethacin, a new anti-arthritis drug introduced in December 1964, and the subject of a leading article in the *B.M.J.* (22 May 1965, p. 1329), has already contributed to the reports of suspected adverse reactions reaching the Committee. Only eight reports concerned serious complications, but it is recommended that this drug should be used cautiously.

Mefenamic acid has also been investigated. The only untoward effect consistently reported was diarrhoea. While the overall incidence of this has been probably less than 5%, it has frequently been severe and sometimes associated with gastrointestinal haemorrhage.

The Committee point out that although anti-arthritis drugs cause serious reactions in a small number of cases they regard them as useful drugs for serious conditions and do not propose to make any recommendations to the Health Ministers about their use.