

Visual problems in children: detection and referral

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SUMMARY. A study was made of 151 children referred to orthoptic clinics for suspected squint or suspected impairment of visual acuity. In only 50 children was there no abnormality. The contribution of different branches of the health service to detection and referral was measured. Parents and general practitioners were found to have an important role in early detection and referral, but there remained an important group of 19 children with squints undetected by their parents.

There was some evidence of delay in referral, with less than half of the children with true squint being seen by a specialist within six months, and the reasons for this are discussed in terms of parents' and doctors' understanding of visual problems in children. Delay is discussed in relation to the complexity of services for child health and to recent proposals for the integration of paediatric surveillance in general practice.

Introduction

SQUINT and errors of refraction are common problems in childhood.¹⁻³ Squint, in particular, may lead to loss of visual acuity owing to suppression of the image in the deviating eye (amblyopia). Clinical and physiological studies⁴⁻⁷ indicate that early detection of squint and amblyopia is of prime importance if irreversible visual loss is to be avoided.

A number of studies^{1,8,9} have pointed to delay in referral of children with squint and amblyopia. This has led several authors¹⁰⁻¹² to advocate more comprehensive vision screening services though there is some debate as to how this screening should best be organized.¹³

The reasons for the delay in referral are not clear. While the difficulties of detection in the under three-year-olds must contribute,⁴ delay may also be related to parents' and health professionals' perceptions and limited understanding of visual problems.^{14,15} Little appears to have been written about the value of parents' observations of their children.¹⁶

This study aimed to examine in detail the use of services and mode of detection and referral of children with suspected squint and suspected impairment of

visual acuity referred to orthoptic clinics. In particular, the contribution of parents' observations to referral was measured. Where there was evidence for delay in referral, reasons for such delay were sought.

Method

One hundred and fifty-one children under the age of 16 years (77 boys and 74 girls) were studied over a six-month period in 1980-81. All these children had been newly referred with suspected squint or impairment of visual acuity and assessed at the two orthoptic clinics in Newcastle hospitals. The children who were studied were the consecutive referrals who lived within the boundaries of Newcastle Area Health Authority (Teaching). The age of the children at first attendance at the Ophthalmology Department ranged from two months to 11 years 7 months. The mean age was 46 months.

The parent or guardian of each child was interviewed using a structured questionnaire (147 out of 151 were contacted). Parents were asked about their own observations of the problem, their use of the health services, the mode of referral and the time of identification of a visual problem. Social class measurement was based on father's occupation and allocated according to the Registrar General's classification. The social class distribution of the sample did not differ markedly from that in Newcastle as a whole.

All children were examined both by an ophthalmologist and an orthoptist. Orthoptic assessment for squint employed corneal reflections, ocular movements, cover test, 20 dioptre prism test and a synoptophore. Visual acuity was assessed with a Snellen chart in older children; Beale Collins pictures and Sheridan Gardner letters were used in younger children. Fundal examination was carried out by an ophthalmologist.

Diagnostic criteria for amblyopia were: a difference of at least two lines on the visual acuity chart calculated for a distance of 6 m with correction if necessary; or, in young children unable to cooperate with visual acuity testing, an obvious difference in behaviour when one eye was covered compared with the other in the presence of unilateral tropia.

Results

On orthoptic and ophthalmological assessment, 94 of the 151 children were found to have a squint with or without refractive error. A further seven children had refractive errors in the absence of a squint. In the remaining 50 children, no abnormality was detected. Using the criteria described in the methods section, 38 children (25 per cent) were found to be amblyopic and 37 of these children had a clinically detectable squint. One child suffered from anisometropic hypermetropia and was amblyopic in the absence of detectable squint.

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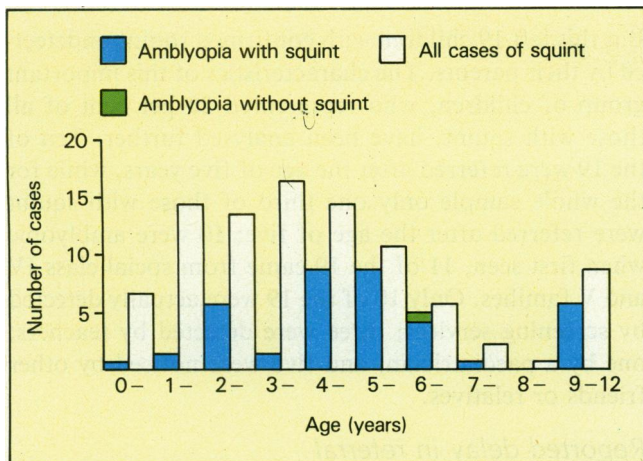


Figure 1. Age distribution of cases of amblyopia and cases of squint.

The age distribution of children with squint and amblyopia when first seen in the Ophthalmology Department is shown in Figure 1. Details of age in relation to social class are shown in Table 1. No children in social class I and II with squint presented after the age of six years, while 38 per cent of those in social class IV and V were over six years old when first seen.

Suspecting a visual problem

We sought to discover how often visual problems were first suspected by parents and how often by professionals. In 60 per cent of children the parent was the first person to suspect a visual problem and in only 24 per cent of the cases referred was a problem first suspected by a health professional (Table 2).

Initiating contact with the health service

Since parents rather than professionals were often the first to suspect a visual problem, early referral to the specialist must have depended upon whether the parents initiated consultation with a health professional about the suspected problem (Table 3). In 92 cases (63 per cent) consultation had been initiated by the parent, but there was a group of 29 children, with confirmed visual defect, whose parents had not initiated consultation; in nine of these cases, the parents had noticed some abnormality but had not considered it necessary to seek advice. Twenty-one of these children were identified directly by screening services; two were identified when consulting a doctor for other reasons; the remaining six were identified by nonmedical professionals, five by teachers and one by a speech therapist. Where parents had made the initial contact with the primary health care services, their suspicions of a visual abnormality were confirmed by specialist assessment in 68 out of 92 children (74 per cent). When a health professional had initiated the consultation on their own suspicions of a visual abnormality, only 23 children (49 per cent) were found to have an abnormality on assessment.

Table 1. Age at first attendance at Ophthalmology Department in relation to social class for children with confirmed squint. Number of missing cases = 2.

Age (years)	Social class			Total number of children in each age group
	I and II	III N and III M	IV and V	
0-	8	20	6	34
3-	9	22	10	41
Over 6	0	7	10	17
Total	17	49	26	92

Table 2. Person who first noticed a visual problem. Number of missing cases = 6.

	Number of children
Parent	90
Relative, friend, teacher	24
Health visitor	5
Community health service	20
General practitioner	6

Table 3. Person who initiated consultation about suspected visual problem in relation to the outcome of the ophthalmological assessment. Number of missing cases = 5. (Percentages in parentheses.)

Person who initiated consultation	Outcome of ophthalmological assessment		Total
	Number of children with no visual abnormality (%)	Number of children with visual abnormality (%)	
Parent	24 (26)	68 (74)	92 (100)
Teacher or speech therapist	1 (14)	6 (86)	7 (100)
Health professional	24 (51)	23 (49)	47 (100)
Total	49	97	146

Referral to the specialist

General practitioners made the single largest contribution to referral to the specialist, directly referring 70 out of 151 children, and making a further 22 referrals on the recommendation of an optician's written report. Community health services referred 50 children (Table 4). Less than half the children were referred to a specialist as the result of a single consultation with a health professional. In all, 286 consultations were made by 145 of the subjects, including consultations with health visitors and opticians; 67 children were referred after one consultation, 46 after two consultations, while 32 reported making three or more consultations before referral. Of the children, 73 saw only one health pro-

Table 4. Person referring patients to the specialist. (Percentages in parentheses.)

	Number of children
General practitioner	70 (46)
General practitioner via optician	22 (15)
Total general practitioner referrals	92 (61)
Child health clinic	28 (18)
School clinic	15 (10)
Community ophthalmologist	7 (5)
Total community health service referrals	50 (33)
Paediatrician	7 (5)
Self-referral	1 (<1)
Other	1 (<1)
Total	151 (100)

Table 5. Reported delay in the referral to specialists for all children with suspected visual abnormality. Number of missing cases = 3. (Percentages in parentheses.)

Delay in referral (months)	Number of children
0-5	70 (47)
6-11	32 (22)
12-23	28 (19)
24-47	11 (7)
Over 48	7 (5)
Total	148 (100)

fessional before referral, 50 saw two different professionals, while 22 saw three or four different professionals before referral to a specialist. Opticians and health visitors cannot refer directly for specialist opinion.

Other advice

Parents frequently sought advice from a lay or professional person other than the referring doctor; 88 (60 per cent) reported seeking advice. Parents were asked to give details of the professional advice that they received. Although the evidence is anecdotal, there were a number of reports which suggest that parents were receiving inappropriate information and reassurance when seeking advice. On occasion this led to considerable delay in referral.

Parents' observations of squint

To assess the 'accuracy' of parents' assessments, their reported observations were compared with the ophthalmological assessment. Parents who had independently observed a squint were proved correct in 71 per cent of cases; those who had not observed a squint were correct in 57 per cent of cases in that no squint was seen on assessment. Overall, parents' assessment of the presence or absence of squint was correct in 66 per cent of cases.

But this left 19 children with confirmed squint undetected by their parents. The characteristics of this important group of children, who represented 20 per cent of all those with squint, have been analysed further. Ten of the 19 were referred after the age of five years, while for the whole sample only one third of those with squint were referred after the age of five; 10 were amblyopic when first seen, 11 of the 19 came from social class IV and V families. Only 10 of the 19 were actually detected by screening services; three were detected by teachers; one by a paediatrician; and five were noticed by other friends or relatives.

Reported delay in referral

All parents were asked to report the time when a visual problem was first suspected irrespective of who first identified it. An indication of delay in referral could thus be made. The mean reported delay between first suspicion and hospital consultation was 12 months with a range of 0-83 months (Table 5). For those with confirmed squint, the mean reported delay was 13 months. The mean delay between the date of the referral letter and date of first attendance at the Department of Ophthalmology was just over eight weeks.

Discussion

This study was primarily designed to examine the referral process for children with suspected visual problems in the hope of elucidating possible causes of delay. The study was retrospective, and in obtaining evidence relied heavily on parental memory. As this was not a population survey, no conclusions can be drawn about the levels of undetected squint and amblyopia in the community.

Given the limitations of the methodology, it is perhaps disturbing to find that the mean reported delay between first suspicion of a visual problem and consultation with a specialist fell just short of one year. In 1960, Miller and colleagues in Newcastle⁸ reported that only 19 out of 40 children with squint were seen by an ophthalmologist within six months of reported onset. Twenty years later the situation was little changed, with less than half of the children with true squint in this sample seen by a specialist within six months.

Early referral for suspected squint is essential in preventing irreversible amblyopia. Once children start school they may be less cooperative with patching for amblyopia. In this study 30 per cent of those with squint were over the age of five years at the time of presentation to an ophthalmologist.

Visual screening

The debate concerning vision screening and early referral has tended to focus on child health services rather than general practitioners. General practitioners clearly have an important role in effecting early referral as they referred the majority of cases in this sample, and 72 per

cent of children had visited their general practitioner at some time about the visual problem. This finding underlines the false division between 'curative' and 'preventive' services.

Parents are seldom given credit for their important role in 'screening' for visual abnormality. The majority of children with confirmed visual abnormality were presented by the parents, who had independently detected nearly 80 per cent of all cases of squint. However, there is an important group of visually abnormal children whose condition will be neither detected nor presented by their parents, which it is the task of the screening services to identify. Yet eight of the 29 children with visual abnormalities not presented by their parents were not detected by screening services. Though the numbers are small, it was found that those children whose squints were not detected by their parents tended to present later to the ophthalmologist and to be amblyopic at presentation.

It is disturbing to find that so many parents had to consult several professionals before referral to the specialist and that on many occasions the same professional was consulted more than once. Although those responsible for paediatric surveillance may 'screen out' some 'inappropriate' referrals, the high level of repeated consultations suggests that those with genuine complaints were finding difficulty in obtaining appropriate referral.

The degree of delay depends on the parents' perceptions of the squint and whether or not they seek professional advice, the understanding and action of health professionals, and the number of different services which children sometimes pass through before referral.

Vision screening tests are often difficult to interpret, especially in the younger child,^{4,17} and accurate assessment requires training and constant practice. The results of this study suggest that those involved in paediatric surveillance would be well advised to take a careful history from parents and to heed their observations, regardless of their own clinical assessment. This may be just as important as attempting more complex assessments of visual acuity and cover testing which can provide false negatives even in the most skilled hands. Where there is any suspicion of squint or amblyopia, immediate and direct referral to the Orthoptic Department would appear to be the appropriate response.

Population screening by orthoptists in the community has been established for pre-school children in some areas.^{12,18-20} These projects, however, are fraught with the problems of non-attendance, and before embarking on yet another service for paediatric screening, there is a case for streamlining the current system.

There is a clear need to educate all those involved in paediatric surveillance, including parents, in the dangers of untreated squint and amblyopia. If the spirit of the RCGP and Court reports on child health services^{10,21}

were implemented, we might look forward to greater coordination not only within community services but also between community and hospital services for children. If paediatric surveillance is brought into the realms of general practice, general practitioners will have even greater responsibility for reducing the number of children presenting late to the orthoptic services with irreversible amblyopia.

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