

THE SUBJECTIVE VISUAL ASSESSMENT OF THE SEVERELY MENTALLY HANDICAPPED CHILD

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Abstract

This paper describes an Orthoptist's role in the assessment of visual problems in the severely mentally handicapped child.

The tests employed and the findings of strabismus, nystagmus and visual acuity, are discussed. This work is the result of the examination of 385 patients.

Key words

Visual acuity, strabismus, nystagmus, mental retardation.

In this, the 'Year of the Child' it seems appropriate that attention should be given to a special group of children. Until quite recently, it has been customary for the majority of the populace to consider little, if anything, could be done to assist their problems. I refer to the severely mentally handicapped child. Over the last 5 years, I have worked with these children, at Marsden Hospital, Westmead, N.S.W., a unique residential environment that has care for 300 moderately and severely mentally retarded children, below the age of 16 years.

Marsden is fortunate to have an extremely comprehensive 'team' -- comprising medical, nursing, psychological, social working, and educational members, plus occupational and physiotherapists, and an orthoptist. All areas interact with each other, and, as a great number of ocular problems are suspected, the eye clinic is kept fully occupied.

The 'eye team' at Marsden comprises an ophthalmologist, a general trained nursing sister and orthoptist, with referrals for assessment coming from any of the previously mentioned bodies.

Following the suggestion of the Ophthalmologist, the usual procedure at Marsden varies somewhat from other eye clinics, in that a "subjective" screening by the Orthoptist is carried out before the assessment by the Ophthalmologist.

Owing to behavioural, communication and physical disabilities evaluation of these patients presents problems in many aspects. The fact that the range of I.Q.'s is 38 and below, indicates that the majority of the patients have difficulty in understanding exactly what is required of them. Thus 'subjective visual assessment', as used in this paper, could be euphemistically defined as patient awareness and/or participation as opposed to objective assessment as described by Henry¹.

We try to assess these children using the basic routine tests of the orthoptic history card. However, obviously these children are unable to cope with many of the tests and therefore modification and limitations are necessary and achievements in this situation are explained below.

The patient is brought to the eye clinic by a nurse from the resident ward, i.e. by a person known to the child. This, we find, lends a sense of security to the child who is often extremely apprehensive of the situation. In the case of outpatients, a parent accompanies the child. A general trained nursing sister is always present in the clinic, and is of valued assistance with the behavioural and medical problems experienced by the patients.

Each child MUST be assessed individually and without interruption. Merely to gain the patient's confidence, co-operation and attention can take up to half an hour. Thus plenty of patience is an absolute necessity.

Investigation

The history is already provided in the patient's hospital file. The staff compiles an extensive comprehensive coverage of each child and any detail is recorded whether it be medical or social. Medication charts, which at times prove invaluable, are also available.

Symptoms are extremely rare and the parents and/or Marsden staff — doctors, teachers and nurses are the main source of supply in this area.

A wealth of knowledge is gained simply by observation: mannerisms, dexterity, facial asymmetry, general physical defects, abnormal head posture, strabismus, nystagmus, cosmesis, and visual alertness. Once sufficient trust has been gained and the patient's apprehension has abated, the testing procedure is commenced.

Tests

1. Cover Test is nearly always only carried out for near at a distance of 35 cms. as the child proves easily distracted from tests at 6m. A pen torch is always used and heavy reliance is placed initially on corneal reflections. Dissociation takes place when possible and fixation objects of varying sizes are utilized.
2. Ocular Movements are difficult to investigate, but many of the children will co-operate when encouraged and occasionally saccadic movements can be tested.
3. Convergence near point can be frequently tested. The only limitation being the questioning of diplopia on convergence break. Voluntary convergence is rarely performed.
4. Measurement of Angle of Deviation is achieved with prisms and this again is mostly at 35 cms., in the primary position. It is only the occasional child that has sufficient concentration to fixate at 6m. for the required time to take a measurement. The Hirschberg and Krinsky methods are used when possible. Prism Cover Testing is virtually unthinkable and/or extremely frustrating.
5. Pupillary Reaction is a test that is carried out, both directly and consensually, on every child. Despite the substantial drug dosages that many of the children are required to take, we have found surprisingly few pupillary reaction abnormalities.
6. Visual Acuity testing methods at Marsden are limited and the main instrument for measurement is the Catford visual acuity apparatus. However, it is possible with a few children to use Snellen's numbers and Fooks symbols, and five (5) patients have been able to read Snellen's letters.
7. It is interesting to read Seemin *et al*² on their findings of the Catford Apparatus, and I quote in part "that this technique is not a foolproof method" — with which I must agree. Yet, I question "what is". The same authors also state, and again I quote in part "that this optokinetic-nystagmus-like stimulus is a good qualitative test to determine the presence or absence of formed vision, but has limited utility in quantitating the degree of vision . . . and cannot be used to determine the exact level of vision". Be it so, but we have found the Catford drum a necessity with our work at Marsden and know of no other method that betters this apparatus at the present time. It is perhaps interesting to note that the very few patients on whom we have been able to compare the visual acuity on Catford drum and Snellen's number chart — show a discrepancy of one line — the chart giving the better acuity.
8. Catford & Oliver³ in their series of testing with the drum used an oscillating speed of 1 cycle per second at 60 cms. This speed and distance were suitable for most of children at Marsden, but a few were only able to follow at a much reduced speed and the appropriate reduced distance. The drum is used mostly in the horizontal plane, but the vertical and oblique planes are employed when necessary, e.g. if horizontal nystagmus is present, or to check all the pathways of supra nuclear function.
9. Colour Testing is not often carried out, however, to know a few can cope with Guy's Colour Test, could be of interest to others working with mentally retarded people. The Ishihara Charts seem to be far too confusing for these children in our experience.
10. Visuscope examination is possible with a few patients. It is interesting to note that very few foveal reflexes are seen.
11. Prisms: the 4 Δ is not a satisfactory test with these patients — it is too small a movement to elicit an accurate response owing to their lack of concentration. 15 Δ elicits no response as the image disparity tends to be ignored — so a compromise is made and a 10 Δ is used where possible, and a few patients give a response, be it normal or abnormal.
12. Titmus Test is possible to carry out with a surprising number of the children. There are

always those that object strongly to the glasses, and those whose behaviour does not make the test possible. But in spite of the communication difficulties assessment of the test is made by observing the child's reaction when the Fly is presented. Occasionally the Animals are used and very few are able to give answers on the Circles.

13. Worths Lights. I always enjoy this test — never before has so much been seen by so few and a rainbow looks like a very small paintbox of colours by comparison! Needless to say, the spotlight using red and green goggles gives a better indication of visual function. By using this adaptation, it has been possible to gain accurate answers with some of the older and better children.
14. The Lang's Pen Location Test is rarely used, as communication and co-ordination problems are an enormous barrier. However, in some cases, this test has served to indicate binocular function.

Not all tests can be performed on every patient, they have only been listed as an indication of what

has been found can be achieved with this level of mental retardation. There may well be other tests which I have not thought about, and any suggestions on the subject will be welcomed.

A synoptophore is not warranted with these children and any cases requiring further follow-up and testing are referred to outside orthoptists. Up to date there has only been 4 cases — 2 prior to surgery and 2 for attempted treatment.

Findings

Of all the facts and figures we have established in the eye clinic at Marsden Hospital, and as detailed in Henry's¹ paper, three (3) categories have been selected to examine in more detail from an Orthoptist's point of view.

Strabismus

Of the 385 patients seen 216 (56%) had squints of various types. This percentage is high when compared to the frequency of strabismus occurring in the normal population.

The classification of strabismus distribution is detailed in Table 1.

TABLE 1
STRABISMUS DISTRIBUTION OF 216 PATIENTS

Type of Squint	No Associated Factor	Accommodative Element (A)	Vertical Component (B)	A & B	Total
CONVERGENT:					
Intermittent	14	11		1	26 (12%)
Constant	57	20	17	3	97 (44.9%)
DIVERGENT:					
Intermittent	17		13		30 (13.9%)
Constant	32		25		57 (26.4%)
CONVERGENT/ DIVERGENT:	3		2		5 (2.3%)
VERTICAL:	1				1 (0.5%)
TOTAL:	126 (58.3%)	31 (14.4%)	56 (25.4%)	3 (1.9%)	216 = (100%)

It is interesting to note that a total number of 35 (16.2%) showed an accommodative influence. Accommodative element in this series is diagnosed only by observing an increase in angle with a more detailed fixation target, because more refined tests were not possible.

Of the remaining 167 patients, 107 (28%) had no manifest defect on cover test. This group includes heterophorias which by comparison were without problems.

62 (16%) of the patients were unable to be

assessed either because of behavioural problems or they were seen only by the Ophthalmologist.

Nystagmus

A very high incidence of nystagmus revealed itself in this study — 96 cases (25%). This posed the question of how to present the findings. I have chosen to compare the nystagmus readings in relationship to the strabismus findings — other comparisons could be a subject for further study in the future.

TABLE 2
NYSTAGMUS

Strabismus	Horizontal	Torsional	Horizontal & Torsional	Horizontal End Pt.	Torsional End Pt.
I. HORIZONTAL					
1. CONVERGENT:					
Intermittent	1		1		
Constant	18	2	1	1	
Constant with Accom.	7				
2. DIVERGENT:					
Intermittent	1				
Constant	14	3	2	1	
II. HORIZONTAL WITH VERTICAL					
1. CONVERGENT:					
Intermittent	—	—	—	—	—
Constant	4		1	2	
2. DIVERGENT:					
Intermittent	1	1		1	
Constant	8	1	3	1	
III. CONVERGENT TO DIVERGENT WITH VERTICAL:					
	1	1			
IV. VERTICAL:					
	1				
V. NO SQUINT:					
	1	1	1	5	1
VI. NO COVER TEST POSSIBLE:					
	9				

These findings are detailed in Table 2.

In the category, no squint detected — total 9, there is an explanation for each case, except one.

- The horizontal nystagmus was progressive pathology.
- torsional nystagmus — a case of birth injury.
- horizontal & torsional nystagmus was a cerebral palsy child.
- Of the 5 children showing horizontal end point nystagmus, one was albinotic (a nystagmoid movement was evident only in strong light), one was hydrocephalic, one had Down's syndrome, and one had cerebral palsy. Pathology was unknown in one patient.
- Torsional nystagmus, present only in extreme

dextro version, was seen in an epileptic child.

Visual Acuity

In this field of work it is more relevant to record the best functional visual acuity than to investigate the amblyopic readings. To know at what level a child can visually perform is of great value.

Maximum vision of 315 patients was recorded, and after compiling the figures and as detailed in Table 3, it was surprising to find that 158 patients (50.2%) had a reading of 6/9 or better.

Of these figures, 298 (94.6%) of the readings were recorded on the Catford visual acuity apparatus. These are the total readings of the best vision recorded in the following ways:—

TABLE 3
VISUAL ACUITY OF 315 PATIENTS

VISION	NUMBER OF PATIENTS	PERCENTAGE
Less than 6/60	21	6.7
6/60	7	2.2
6/36	11	3.5
6/24	16	5.1
6/18	37	11.7
6/12	65	20.6
6/9	104	33.0
6/6	49	15.6
6/5	5	1.6

BOTH EYES OPEN

MONOCULAR — i.e. True Alternators with equal V/A

R.E. only

L.E. only

The readings from the R.E. & L.E. results have further been analysed into four categories as to why it should be the eye giving the best vision.

These are:

Fixing Eye	—R.E. 22.8% or 72 patients L.E. 12.1% or 38 patients
Least Ametropic Eye	—R.E. 1.0% or 3 patients L.E. 1.9% or 6 patients
Other Anomalies	—R.E. 1.9% or 6 patients L.E. 1.9% or 6 patients
Causes Unknown	—R.E. 3.5% or 11 patients L.E. 2.6% or 8 patients

Discussion

Much has been written around the world of the ocular problems of the Cerebral Palsied Child, the Down's Syndrome and Rubella patient, and lately of Mentally Handicapped Children. All lead to the same conclusion that there is a high incidence of ocular anomalies and in many instances late recognition and analysis of the defects. Our findings at Marsden can only lend support to others.

For the severely Mentally Handicapped group, orthoptic treatment is not applicable. However, a reasonably comprehensive examination can be performed with patience and time.

Correction of significant refractive errors by spectacles has not proved to be a great problem with regard to acceptance — the teaching staff being of tremendous assistance in encouraging the wearing of the glasses in the school room, and with pleasing results in visual improvement. Lens occlusion has been carried out on six (6) children with improvement.

Cosmetic surgery has been performed on five (5) patients with mixed results.

The age of onset of squint has been impossible to determine in the past, but our range of patients now extends from three (3) months to 16 years,

and with early intervention many secondary anomalies can be prevented.

All ocular information is recorded in the patient's history file, giving ready access to all other disciplines. The visual acuity is frequently of a high standard thereby permitting members of the other teams to relate their assistance and treatment to the patients' mental and physical capabilities.

Summary

In summary, it does seem that an Orthoptist plays an important role in the assessment of the Mentally Retarded Child, regardless of the severity of the handicap. Apart from his/her contribution to the complete ocular assessment which is regarded as direct assistance to the patient, i.e. to gain their best vision capabilities, indirectly he/she is contributing to the well being of the child by combining with other disciplines to ensure that his maximum potential is realised.

There is room for more Orthoptists in this work, and hopefully in the near future our numbers will be greatly increased.

Acknowledgements

There are many people to whom I must express my appreciation for their interest in this paper, but in particular, I wish to thank for their assistance, guidance and encouragement:—

Dr. Graham Henry — Marsden Hospital, Westmead, N.S.W.; Dr. Audrey Greenberg — Marsden Hospital, Westmead, N.S.W.; Sister Carolyn Low — Marsden Hospital, Westmead, N.S.W.; Mrs Neryla Jolly — Cumberland College of Health Sciences, Lidcombe, N.S.W.

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