
OPTOMETRIC SERVICES IN A READING DISABILITY CLINIC: INITIAL RESULTS

KENNETH C. KOSLOWE, O.D., M.S.

Abstract

A multi-disciplinary learning disability clinic was founded and, for the first time in Israel, decided to include optometric services as part of the diagnostic and treatment services. All patients evaluated were in normal classes and were referred by their classroom teacher for testing. After one year, a retrospective analysis of the results was performed in order to evaluate the efficacy of such services in this framework. In order to avoid examiner bias, a representative random sample of the records were evaluated by a group of optometrists who were unaware of the background of the subjects. The results confirmed the initial examiner's diagnosis of deficient binocular vision requiring intervention. Out of the total patient pool in the first year (N = 100), 41% were deemed to have binocular vision defects that were sufficiently severe as to require treatment. Possible reasons for this finding and implications for further research are discussed.

Key Words

learning disabilities, binocular vision, multi-disciplinary clinic, vision therapy

In 1983, the city of Herzliya, Israel, in conjunction with the Ministry of Education, decided to establish a Center for Remedial Reading. This was meant to be a multi-disciplinary center including remedial reading teachers, speech therapists, a psychologist specializing in learning disabilities, an art therapist and occupational therapists. As a result of lectures that I had given in the vicinity, it was also decided to include an optometrist (myself) as part of the staff. The work parameters set out for optometry in this setting were: binocular vision assessment, visual-motor assessment, binocular vision treatment and visual-motor therapy.

In the first year, 100 students were evaluated and it was felt that an analysis of the findings would be advantageous in planning future work. The results seemed striking enough to warrant further analysis, leading to this retrospective research report.

While there continues to be a debate as to the influence and effect of binocular vision defects on learning and reading disabilities,¹⁻⁷ there seems to be general agreement on the need to treat such problems when they do arise in the learning-disabled child.⁸⁻¹³ One of the facts still in doubt is the rate of occurrence of binocular vision defects in children with reading/learning problems. This paper was not meant to answer this question, but the results do provide additional evidence backing those who view such defects as being fairly widespread in such populations.

Subjects

One hundred subjects were referred for visual evaluations during the school calendar year (September 1983 - June 1984). All subjects were identified by the school as reading-disabled and all were currently in a normal classroom setting. During the course of their previous educational frameworks (nursery school, kindergarten, primary school) they had already been evaluated in well-baby clinics and/or by the school nurse (and subsequent full eye evaluations) in order to ascertain whether they had visual defects. It was thought that all those who needed glasses already had them. All subjects were currently attending elementary school (grades one - six). The average age was 9.2 years (s.d. = 1.7).

Methods

All subjects underwent a visual evaluation consisting of: unaided acuity (distant), cover tests (distant and near), ocular motility, retinoscopy, subjective refraction, far and near vergences (in phoropter), and near fusion testing with a vectogram. In some cases not all the testing could be successfully completed; for example, in cases of suspension of fusion during phorometric testing. Additionally, all subjects underwent a visual-motor and perceptual battery based on the SUNY Optometric Center of New York protocol.¹⁴ This aspect of the testing is not addressed in this paper and will be the subject of a separate paper at a later date.

Originally, I analyzed the data as each patient was evaluated. The reason for this

was that the evaluations were performed in a clinical setting for the sole purpose of identifying and treating those subjects who were in need of either vision therapy and/or glasses.

However, in order to more precisely interpret the data, examiner bias had to be considered since I both examined and interpreted the clinical data. Consequently, I used the following method.

A random sample of 50 records was selected and the results of the visual evaluations were recorded. Each subject was given a number from one to 50. These records were then sent to five independent optometrists with experience and expertise in the area of binocular vision. They were asked to evaluate the raw data and to state if they agree, strongly agree, disagree or strongly disagree with the statement: "Based on the data presented, this patient has a deficit in binocular functioning that requires vision therapy and/or spectacle correction." One problem which was noted by some of the responding optometrists was coming to a conclusion without knowing if there were symptoms and/or an academic problem. It was felt that this weakness was unavoidable and the optometrists were asked to reach a conclusion based on the information provided. One of the respondents felt that he could not reach such a conclusion in a number of cases and so the results of the other four questionnaires were included in this paper.

Results

Forty-one percent of the subjects were deemed to have a deficit in binocular vision requiring treatment by either lens application or vision therapy. An additional 4% had constant strabismus, while 6% had refractive anomalies, not fully corrected but unrelated to the subjects' binocular status (myopia, astigmatism, etc.). The remainder (49%) were found to have a trouble-free visual status. The number of subjects with abnormal binocular vision differed from a normal distribution with a degree of significance at the $p < .01$ level. The types of non-strabismic anomalies of binocular vision revealed were fairly evenly distributed between esophoric and/or reduced divergence cases ($N = 20$) and exophoric and/or reduced convergence cases ($N = 17$). Four subjects were diagnosed as general skills cases (deficits in both convergence and divergence fusion ranges). In 13 of the "esophoric" sub-

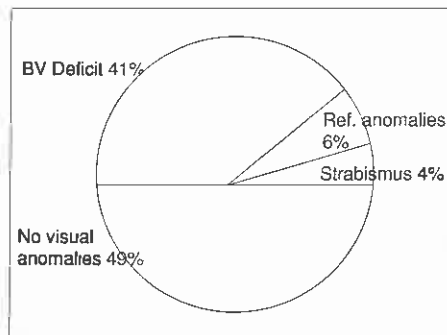


Figure 1. Representation of the results of the 100 subjects examined September 1983 - June 1984.

jects, lens application alone was recommended, while in the remainder vision therapy was recommended. The results are shown in Figure 1.

The evaluations of the independent examiners regarding the presence of a binocular defect requiring intervention were each compared to the evaluation that I made.

In all cases the results were found to be highly correlated at the .01 level of confidence. This is reported in Table 1. It should be stressed that no attempt was made to correlate the exact diagnoses, only that a binocular deficit was present.

Table 1

A = Examiner evaluation
 B = Independent evaluator number 1
 C = Independent evaluator number 2
 D = Independent evaluator number 3
 E = Independent evaluator number 4

Comparison	Correlation Coefficient (r)	Significance
A vs. B	0.725	$p < .01$
A vs. C	0.786	$p < .01$
A vs. D	0.880	$p < .01$
A vs. E	0.883	$p < .01$

Discussion

The findings of this study, at the very least, show the importance of including optometric services in the educational setting, particularly in the field of learning disabilities. A significant number of students who were judged reading-disabled by their schools had binocular vision deficits. One possible contaminant in this finding is the fact that this study only covers the first year that optometric services were provided. As such, it is possible that an abnormally high number of defects were found that normally would have been discovered over the course of a number of years. However, my experience in this clinic in the ensuing years does not

support this conclusion, as the rate of binocular deficits among children referred here continues to run at approximately the same rate. In the future, I will repeat this study using the data of the first seven years in order to more firmly examine this point.

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Corresponding author:

Kenneth C. Koslowe, O.D., M.S.

10 Ahimeir St.

Petach Tikva, Israel

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