

## SENSORY AND TECHNICAL ASPECTS OF VISION SCREENING

The original articles presented in this edition of the Australian Orthoptic Journal reflect a theme which includes both the sensory and technical aspects of vision screening. Jennings' research demonstrates an integration of an indepth understanding of available perimetric technology and a knowledge of the pathological processes of diabetic disease. These combined facets have produced a clinically orientated research question which has been soundly approached. The Humphrey Field Analyzer Full Field 120 point Threshold Related Screening Test detected visual field deficits in diabetics with and without mild retinopathic signs. The finding that half of the diabetics with no ophthalmoscopic retinopathy had visual field deficits is of major significance for perimetric orthoptists. This original paper supports the recently published diabetic research findings in the Medical Journal of Australia which also demonstrated a statistically significant relationship between the duration of the disease and the level of retinopathy<sup>1</sup>. The author highlights the clinical relevance of these findings and explains the advantages of a perimetric test which is reduced temporally whilst testing a full field. Further research into the differences between patients with mild retinopathy and IDDM versus NIDDM is required. The author emphasizes the potency in screening the

preretinopathic status of diabetics by orthoptists.

The basis of the most commonly used optotype for measuring visual acuity is the visual angle subtended through the nodal point and retinal cone size. The assumptions concerning the area of retinal stimulation are challenged in the research article by Duyshart, who was awarded the most recent Emmie Russell Prize. Form vision components range from minimum visible and minimum detectable to resolving power. The author discusses legibility as a factor in optotypes that are constructed using letters and states that this is not constant. Visual acuity testing involves resolution, perception and recognition. Different areas and dimensions of retinal stimulation were compared at reducing levels of visual angle. The author suggests, from the results of this study that the initial visual process is related to the area of the stimulus and that the geometric design occurs secondarily. This two stage process lends itself ideally to further investigative research into the facets involved in children's shape recognition and the visual acuity levels inferred.

Williams and co-workers have published a comparative study of single and linear optotypes, thus continuing the theme of aspects of vision testing and screening. An important clinical addition to the optotype

armory has been made with single letters surrounded by four crowding bars<sup>2</sup>. The advantages of this design are its conceptual simplicity and its approximation to linear visual acuity levels. These authors studied the visual acuity responses of amblyopes and normals to singles, linear and crowded singles test types. Significantly, the authors confirmed previous findings of differences between singles and crowded singles and linear tests. These differences were apparent in the amblyopic group. No differences in test results were found for the normal group. This equates well as discrimination ability is reduced in amblyopes and forms part of the diagnosis criteria of this condition. The authors rightly state that it is yet to be determined if crowded singles will be appropriate as a vision screening tool.

The theme of vision screening is taken up in the article by Deveraux and colleagues and involves a preventive health project in Nepal. The limitations of the testing protocols highlight the difficulties in maintaining an adequate and constant testing environment in an atmosphere of reduced resources. Priorities become evidently linked to nutrition and basic health requirements. A common reversible ocular problem linked to vitamin deficiency is described in xerophthalmia. Vision and ocular motility referral rates were higher than those recorded for developed countries. The authors suggest that the reasons for the 24% rate may include a lack of public health programs and the relative low socio-economic strata from which the screened orphans had come. Although this was a screening study, immediate remedies for xerophthalmia were instituted by making available adequate doses of Vitamin A. Statistical information from this screening pro-

gram facilitated the possible institution of public eye health programs by documentation of type and incidence of ocular defects. This is a demonstration of international orthoptic co-operation, public health service and clinical education.

A further aspect of screening is the role that it plays in exploring the aetiological factors in particular disorders. This aspect has begun to be investigated in the original article by Ferguson and co-workers. These authors looked at the efficacy of both the stereoacuity and the fusional vergences of normal siblings of subjects with early onset strabismus. Comparisons were made with normal siblings of subjects with no strabismus. Interestingly, reduced stereopsis was recorded in the sibling group with strabismus family history, but fusional vergences were normal. Given our understanding of the role of vergences in maintaining gross ocular synergism even in the presence of strabismus with central suppression or abnormal retinal correspondence, these findings are consistent with binocular vision premises<sup>3</sup>. Subtle vergence defects may occur with conversion of the initial vergence response into tonic vergence levels. This could be investigated through prism adaptation responses. Further research to pursue this avenue of investigation would be to evaluate the precise levels of reduced stereoacuity with purely random dot stimuli as opposed to the polarized contour stimuli of the Titmus Test. This research provides a valid contribution to the current theories of strabismus aetiology.

A rare acquired eye movement disorder is described in the case presentation by Georgievski and colleagues. This patient underwent interstate evaluations and the clinical picture is fascinating. The description is one of saccadic deficits in downgaze,

post head injury. There are associated pursuit anomalies, which are mild, Parinaud pupil signs, and vergence deficiencies which are symptomatic. The anomalous head posture consists of atypical jerky chin down movements. The lesion site is localized to a small hematoma in the upper midbrain, slightly lateral to the midline, and is demonstrated on radiological imaging. Discussion as to the aetiology of this selective deficit leads the authors to review the neurological pathways for vertical gaze. Controversy still exists concerning the differentiation of up and downgaze, the medial and lateral routes of MLF fibres and discrete or common blood supply to the medial and lateral aspects of this upper midbrain area. This article contributes well to the literature on eye movement disorders and shows how clinical features pro-

vide evidence for further investigations. This case highlights the important role that the publication of case reports provides. Individual patient descriptions with specific lesions or disorders contribute along with experimental animal studies to our understanding of ocular pathology. This information can be diagnostic, localizing or have an influence in the management strategies for both common and obscure eye movement disorders.

#### REFERENCES

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