

Clinical Profile of Patients with Vergence Dysfunction at the University College Hospital, Ibadan

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Introduction: Fusional vergences are optomotor reflexes designed to maintain the alignment of the eyes so that similar retinal images are projected onto corresponding areas, a requirement for binocular single vision¹. Vergence dysfunction describes conditions that disrupt normal fusional vergence. Convergence insufficiency (CI) is the inability to maintain convergence on objects as they approach the eyes from distance to near.² There is variability in the reported prevalence of CI, ranging from 1.75 to 33% with an average of 5%³. There is no known ethnic or racial predilection. Anecdotal evidence suggests that tests of vergence dysfunction are not routinely performed in many ophthalmic practices in our environment. The aim of this study was to describe the clinical profile of patients diagnosed with CI and Fusional Dysfunction (FD) in the Pediatric Ophthalmology and Strabismus clinic of University College Hospital Ibadan, since the screening for vergence dysfunction became routine in the clinic.

Methods: This was a retrospective review of case notes of patients diagnosed with convergence insufficiency and fusional vergence dysfunction between April 2015 and June 2017. The diagnostic criteria used for convergence insufficiency were exodeviation at near or ≥ 4 prism diopter(Δ) difference between distance and near, remote near point of convergence (NPC) of 6cm or higher, reduced convergence amplitudes (less than 35Δ base out), and history of difficulty with near tasks.^{2,4,5} While the diagnostic criterion for fusional dysfunction was reduced fusional convergence amplitude irrespective of the patient's NPC.

Results: A total of 20 patients were reviewed. Their mean age was 13.6 (± 3.94) years with a range of 6-22 years. There were 14 (70%) females. All patients presented with complaints of eye strain during near work. The presenting visual acuity was 6/6 or better in 37 (92.5%) of the 40 eyes (Figure 1). Best corrected visual acuity was 6/5 in all eyes of the patients. CI was diagnosed in 14 (70%) and FD in 6 (30%) patients. Refractive error was negligible ($\leq \pm 0.25$) in 37 eyes (92.5%), see Figure 2. With both groups combined, the range of NPC was 5-19cm, while the range of convergence fusional amplitude was 8-30 Δ base out for near and 2-25 Δ base out for distance. Exophoria at near was present in 10 (76.9%) of the 13 patients in whom it was tested for. Three (15%) of the patients were not diagnosed at first presentation. All patients received home-based pencil push-up therapy.

Discussion: In this study, most patients presented at school age when there is increased demand for near work. It is pertinent to note that three

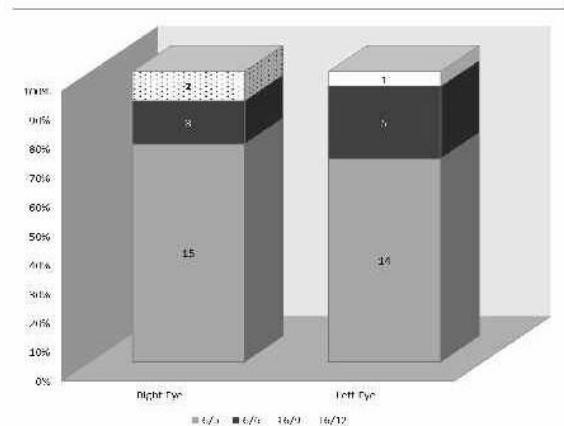


Fig. 1: Presenting visual acuity of the patients

patients were misdiagnosed at first presentation. This portrays the fact that diagnosis may not be obvious from symptoms if the adequate clinical assessments are not performed. CI can be disturbing if neglected, undiagnosed or untreated. Studies have shown a 3-fold higher incidence of ADHD and poor academic performance in patients with CI⁶. We used a cut-off of 6cm for NPC to diagnose convergence Insufficiency in our practice as recommended by Hayes *et al*⁷, however clinical

cut-offs vary. In this study fusional convergence ranged from 8 to 30 Δ for near which is quite reduced when compared with the normal values of 35 – 40 Δ^2 . The limitations of the study include its retrospective nature, the small sample size and

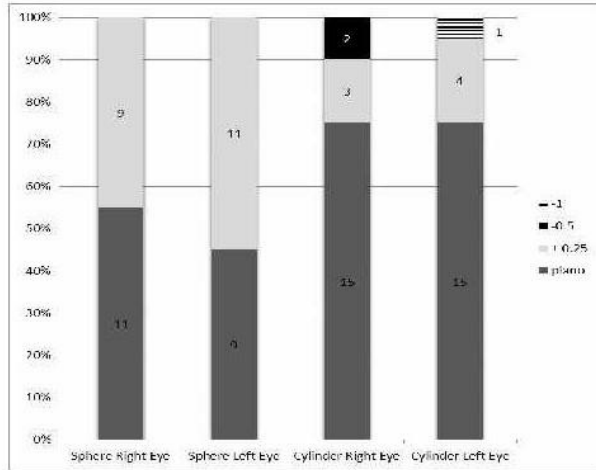


Fig. 2: Refractive errors of the patients' eyes

the fact that the outcome of treatment was not evaluated.

Conclusion: Measurement of fusional amplitude and NPC should be part of routine ophthalmic examination for children and young adults presenting with asthenopic symptoms. Especially in the absence of refractive errors when most patients may be erroneously misdiagnosed as malingering.

References

1. Duane's Ophthalmology 2012
2. Handbook of Pediatric Strabismus and Amblyopia. Edited by Wright KW, Spiegel PH & Thompson LS
3. Jeffrey Cooper and Nadine Jamal, Convergence insufficiency – a major review Optometry review AOA 2012
4. Borsting *et al.* Improvement in Academic behaviours following successful treatment of CI. Optometry and vision Science Jan 2012; 89 (1): 12-18
5. Rouse MV *et al.* Frequency of CI in Optometry clinic setting. Convergence Insufficiency and Reading Study (CIRS) Group. Optometry and vision science Feb 1998; 75 (2): 88-96
6. Granet D.B., Gomi C.F., Ventura R, Miller-Scholte A. The relationship between convergence insufficiency and ADHD. Strabismus. 2005 Dec;13(4):163-168.
7. Hayes GJ, Cohen BE, *et al.* Normative values for the near point of convergence of elementary schoolchildren. Optometry and Vision Science 1998;75(7):506-512