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ARVO Annual Meeting Abstract | June 2022

Does vision correlate with overall development in children with cerebral visual impairment?

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Abstract

Purpose : A significant portion of a child's early overall development is accomplished through visual learning. Children with neurological conditions such as cerebral visual impairment (CVI) are likely to have visual concerns as well as developmental delays in areas such as motor, cognition and speech. Through this study, we aim to determine the correlation between vision loss and the overall development of children with CVI.

Methods : A prospective cross-sectional study was conducted on children with CVI visiting a paediatric neurology unit in India. Grating acuity (Teller Acuity Cards), contrast sensitivity (Ohio Contrast Cards), functional vision (Lantzy's CVI range; phase 1=building visual behaviour, phase 2=integrating vision with functions, phase 3=resolution of CVI characteristics) and developmental quotient (DQ) (Denver Developmental Screening Test-II) were assessed.

Results : Forty-seven children (males: 35) with CVI were included with a mean chronological age of 2.9 ± 1.7 years (range= 9 months to 6.8 years). The mean binocular grating acuity was 1.35 ± 0.67 logMAR (range=2.27 to 0.37 logMAR) and mean binocular contrast sensitivity was 0.49 ± 0.56 logCS (range=0.0 to 1.66 logCS). Grating acuity ($r=-0.36$, $p=0.01$), contrast sensitivity ($r=0.41$, $p<0.01$) and functional vision score ($r=0.5$, $p<0.01$) were significantly and moderately correlated with DQ. Using linear mixed model (age adjusted), the outcome parameters of grating acuity, contrast sensitivity and DQ were compared to the CVI phases. Significant difference was noted across the 3 phases of CVI for grating acuity ($p<0.01$). There was no significant difference between phase 1 and 2 for contrast sensitivity and DQ ($p=0.09$), however phase 3 showed significant difference when compared with other two phases ($p<0.01$).

Conclusions : Vision parameters correlate with DQ in children with CVI. Although there is no separate vision domain in most developmental screening tools, psychologists could consider referring children particularly with lower DQs for vision assessment. Eye-care personnel should also ensure providing referrals to therapists for child's overall development particularly during the early years. The results do not establish any

causation between the 2 parameters (visual vs. DQ) and can be further explored by studying the DQs of children having ocular visual impairment and no additional developmental delays.

This abstract was presented at the 2022 ARVO Annual Meeting, held in Denver, CO, May 1-4, 2022, and virtually.

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