

Frequency of convergence insufficiency among fifth and sixth graders. The Convergence Insufficiency and Reading Study (CIRS) group.

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Abstract

PURPOSE: To estimate the frequency of convergence insufficiency (CI) and its related clinical characteristics among 9- to 13-year-old children. **METHODS:** Fifth and sixth graders were screened in school settings at three different study sites. Eligible children with 20/30 or better visual acuity, minimal refractive error, no strabismus, and exophoria at near were evaluated according to a standardized protocol to determine the presence and severity of CI. These children were classified according to the presence and number of the following clinical signs: (1) exophoria at near $>$ or $=4\Delta$ than far, (2) insufficient fusional convergence, and (3) receded nearpoint of convergence. Also, children were classified as accommodative insufficient (AI) if they failed Hofstetter's minimum amplitude formula or had greater than a + 1.00 D lag on Monocular Estimate Method retinoscopy. **RESULTS:** Of 684 children screened, 468 (68%) were eligible for further evaluation. Of these, 453 had complete data on CI measurements and were classified as: no CI (nonexophoric at near or exophoric at near and $< 4\Delta$ difference between near and far) (78.6%); low suspect CI (exophoric at near and one clinical sign: exophoria at near $>$ or $=4\Delta$ than far) (8.4%); high suspect CI (exophoric at near and two clinical signs) (8.8%); and definite CI (exophoric at near and three clinical signs) (4.2%). CI status varied according to ethnicity and study site ($p < 0.0005$), but not gender. The frequency of AI increased with the number of CI-related signs. For CI children with three signs, 78.9% were classified as also having AI. **CONCLUSIONS:** These findings suggest that CI (defined as high suspect and definite) is frequent (13%) among fifth and sixth grade children. In addition, there is a high percentage of CI children with an associated AI.