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Screening of binocular function with static- and dynamic random dot E stereograms in preschool population

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The objective of this study is to evaluate static- and dynamic random dot E stereogram (S- and D-RDS-E) method in preschool children from two aspects: 1. Compare the reliability and efficacy of Lang- and RDS-E stereotests in detecting binocular pathology and 2. Decide whether RDS-E tests are useful and necessary tests per se or additional tests in screening preschool children. To date, 1020 children at the age of 1.5-7 years were screened in 20 nursery schools. Orthoptic-, Lang-, Snellen acuity-tests, S- and D-RDS-E were performed. Software generated anaglyphic red-green RDS-E stimuli containing the cyclopean Snellen E optotype were presented on a notebook with 16.6-inch LCD screen and viewed with red-green goggles (frame rate:15 Hz; distance:1m). 8 levels of horizontal crossed disparity ($1'$ - $256'$, in octave steps) were introduced in the images. To pass the DRDS-E test 7 out of 8 correct responses were required. In total, 71 and 73 children failed the S- and D-RDS-E tests, respectively, while 56 the Lang test. All Lang positive cases were also found positive with both RDS-E methods. There were 8 children who failed the RDS-E test only and passed all other tests, but eventually proved to be hyperopic (mean 2.56 D) by skiascopy. DRDS-E method is cognitively not more difficult than Lang test and at least as reliable but seems to be more sensitive to mild binocular anomalies potentially leading to amblyopy. Comparison of the sensitivity of S- and D- RDS-E tests requires more study.