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Poster Abstracts
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Comparison of refraction data and visual acuity with and without cyclopentolate

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Purpose: Cycloplegic refraction represents the gold standard in assessing refractive error in children. Internationally, not all eye care providers are authorized to use cycloplegics. Therefore, the necessity of cycloplegic eye drops for determining refraction was evaluated. This investigation compared refraction and visual acuity obtained under cycloplegic and non-cycloplegic condition in a Caucasian population.
Method: One eye of 73 participants, aged 6-29 years, was examined under cycloplegic (CC) and non-cycloplegic condition (NCC) using autorefraction (AR), subjective refraction (SR) and visual acuity was tested. Participants were subdivided into three refractive groups (emmetropia: -0.50 D < SE < +1.00 D, myopia: SE ≤ -0.50 D, hyperopia: SE ≥ +1.00 D).
Results: When comparing AR CC and SR NCC, deviations in SE were largest in hyperopes (ΔSE = 0.74 ± 0.57 D; 95% CI: 0.5 – 0.97 D) compared to emmetropes (ΔSE = 0.37 ± 0.21 D; 95% CI: 0.24 – 0.45 D) and myopes (ΔSE = 0.25 ± 0.32 D; 95% CI: 0.12 – 0.38 D). When comparing SR CC and SR NCC, deviations in SE were largest in hyperopes (ΔSE = 0.54 ± 0.43 D; 95% CI: 0.36 – 0.71 D) compared to emmetropes (ΔSE = 0.23 ± 0.26 D; 95% CI: 0.10 – 0.35 D) and myopes (ΔSE = 0.12 ± 0.17 D; 95% CI: 0.04 – 0.18 D).
In emmetropes and myopes, visual acuity was similar with CC and NCC refraction. For hyperopes, visual acuity worsens by 0.38±0.18 logMAR and 0.22±0.18 logMAR when comparing AR CC prescription and SR CC prescription to SR NCC prescription, respectively.
Conclusions: In hyperopes, CC prescription may worsen NCC visual acuity, however, not in myopes or emmetropes. When comparing AR CC and SR NCC, the difference in SE is marginal in myopes. Since in myopia management continuous refraction tests are essential, NCC refraction is equally suitable whenever CC refraction cannot be performed.

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