

Heru Prime: Clinical Study

ABSTRACT

TITLE: Ocular alignment evaluation using a novel software application running on a virtual reality headset

ABSTRACT BODY:

Purpose: To evaluate the use of a novel software application downloadable on a virtual reality (VR) headset in assessing ocular alignment.

Methods: This prospective case-control study included 65 patients. Each patient underwent near and distant cover tests performed by a masked ophthalmologists (130 cover tests; 51 ortho, 36 phoria, and 43 tropia). Additionally, each patient received near and distant digital cover tests using the Heru cover test software application (Heru, Inc, Miami) that was downloaded on a VR headset equipped with an infrared pupil tracker (Pico Neo 3 Pro Eye, ByteDance, Beijing, China). In the digital cover test, patients were instructed to maintain fixation on visual targets presented on the screen of the VR headset in front of each eye in an alternating manner, while the pupil tracker recorded the resulting eye movements. The ocular deviations were measured in a subset of consecutive tropia patients (20 positive cover tests: 12 near cover tests in 12 tropic patients and 8 distance cover tests in 8 tropic patients) and compared to the clinically measured ocular alignments.

Results: The digital cover test differentiated between the alignment statuses of the ortho, phoria, and tropia patients in a highly significant manner compared to the clinical diagnosis ($P < 0.001$). In the subset of cover tests where tropia was present and quantified, the mean deviation measured clinically was 17 prism diopters (PD, ± 13 PD), while that measured with the digital cover test was 13 PD (± 10 PD). The magnitude of the tropia measured using the digital cover test very strongly correlated with that measured clinically ($r = 0.813$; $P < 0.001$, Pearson Correlation).

Conclusions: The digital cover test in the VR headset can be used in the diagnosis of ocular misalignment. The ocular deviation measured with the digital cover test correlates very strongly with the clinically measured ocular deviation.

