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Abstract Title: **Clinical Evaluation of Visual Evoked Potential Tests Using Dichoptic Stimulations Obtained With Ferroelectric Shutters**

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Purpose: To evaluate the clinical applicability of ferroelectric shutters for the realization of VEP tests of binocular vision including binocular beat, correlogram and stereogram stimulations.

Methods: Dichoptic tests were obtained by coupling a high frame rate (120 Hz) visual stimulation monitor to "stereo goggles" made with fast ferroelectric shutters (less than 1 millisecond on and off switching time). The tests included binocular beats (checkerboards with 10 Hz reversal rate for the right eye and 15 Hz for the left eye), correlograms (30 Hz random dots alternating between correlated and anticorrelated modes at 5 Hz) and stereograms (15 Hz random dots alternating in local disparity at 2.5 Hz). The VEP response was recorded over a period of 20 to 40 seconds and analyzed by FFT. The study involved 11 adult subjects with normal stereo vision and 12 patients with abnormal vision and age ranging from 5 months to 25 years. A video cartoon was displayed before each test to improve the cooperation of young patients.

Results: Normal population: Reliable VEP responses were obtained with binocular beat and correlogram stimulations in all subjects. In 3 subjects (27 percent), responses to stereograms were not detectable or not stable. Patient population: there was a good acceptance of the stereo goggles for patients more than 2 years old. For very young subjects, they were not easily accepted: no test could be performed on the youngest (5 months) and only part of the tests on an 8 months baby. In one case, the VEP results could not be interpreted because of too frequent body movements. In the remaining cases (75 percent): the tests detected all cases of binocular and monocular dysfunction.

Conclusions: This preliminary study shows that the results of binocular beat and correlogram tests realized with ferroelectric shutters are in good agreement with clinical data. Compared to the pattern reversal VEP techniques, the examination time is shorter (20 - 40 seconds and additional information is provided relative to ocular balance and fusion. One limitation is the use of stereo goggles which is not easily accepted by babies before 2 years of age.

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