
ORIGINAL RESEARCH

ESTABLISHING NORMATIVE CHANGE VALUES IN VISUAL ACUITY LOSS DURING THE DYNAMIC VISUAL ACUITY TEST

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ABSTRACT

Background: Baseline visual acuity (VA) loss from static to dynamic head conditions assessed using the Dynamic Visual Acuity Testing (DVAT) have not been established in NCAA football players. DVAT assesses the Vestibulo-Ocular Reflex (VOR) which is measured in Logarithm of the Minimum Angle of Resolution (logMAR). Decreased VA beyond baseline measures may detect VOR impairment and impact treatment protocols and assist in return to play decisions post-concussion.

Hypothesis/Purpose: To establish normative VA mean scores during a static head posture as well as dynamically during the DVAT with a head speed of 150 deg/s in the pitch (vertical) and yaw (horizontal) planes rotating 20 degrees in each direction.

Study Design: Descriptive study, Diagnostic Tests.

Methods: Sixty-seven, NCAA Division I College football players (age = 19.68 ± 1.53) completed static VA and DVAT assessment in the pitch and yaw planes during baseline concussion testing at the beginning of the 2014 regular football season. Comparison of VA was evaluated by calculating the difference in players' static and dynamic VA values using the DVAT.

Results: Static VA for all participants (n=67) was -0.232 ± 0.109 logMAR. Dynamic VA for participants (n=67) was 0.0845 ± 0.159 in pitch and -0.007 ± 0.141 in yaw at 150 deg/sec. Mean losses in VA during pitch and yaw at 150 deg/sec were 0.317 ± 0.140 and 0.227 ± 0.133 , respectively.

Conclusions: VA diminishes during head movement at 150 degrees/sec. Loss of acuity beyond established normative values from baseline may be indicative of VOR dysfunction, especially secondary to head trauma. The assessment of visual acuity function with head movements of 150 deg/sec can potentially identify concussion and subsequent sequelae. Further research is recommended.

Level of Evidence: 2b

Key words: Concussion, oculomotor measures, Vestibulo-ocular reflex

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