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Risk Factors for Post-Concussion Vestibular and Oculomotor Symptoms and Impairment in Adolescent Athletes
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Objective: The Vestibular/Ocular Motor Screening (VOMS) exam was developed to assess vestibular and oculomotor impairment and symptoms post-concussion (Mucha, et. al., 2014). Risk factors including sex, on-field dizziness, and post-traumatic migraine (PTM) are associated with concussion outcomes, but little is known about their association to vestibular and oculomotor outcomes. The current study investigated the association of these risk factors and post-concussion VOMS clinical cut-offs.

Method: Participants included 85 (50 males, 38 females) adolescent athletes assessed with the VOMS exam one week post-concussion. Primary (sex, concussion history, migraine history) and secondary (on-field dizziness, LOC, PTM, fogginess) risk factors were obtained from each participant. Chi-square analyses with odds ratios were used to identify significant risk factors.

Results:
- Chi-square analyses demonstrated that sex \( \chi^2 = 4.9, p = .03, \text{OR} = 3.4 \), on-field dizziness \( \chi^2 = 7.1, p = .008, \text{OR} = 3.9 \), post-traumatic migraine \( \chi^2 = 10.9, p = .001, \text{OR} = 15.9 \) and fogginess \( \chi^2 = 10.3, p = .001, \text{OR} = 6.2 \) were associated with the presence of at least one post-concussion VOMS cut-off score (>2/10 severity). On-field dizziness \( \chi^2 = 3.8, p = .05, \text{OR} = 2.5 \), post-traumatic migraine \( \chi^2 = 10.5, p = .001, \text{OR} = 4.9 \) and fogginess \( \chi^2 = 7.9, p = .005, \text{OR} = 3.7 \) were associated with the presence of a post-concussion near point convergence cut-off score (>5cm).

Conclusion: Athletes with certain risk factors may be predisposed to develop vestibular and oculomotor symptoms post-concussion. Clinicians should consider these risk factors in the management of patients following concussion.