Vestibular Rehabilitation and Cervical Postural Re-education in a Young Athlete Who Presented with Post-Concussion Syndrome: A Case Report

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Background

A concussion is a pathophysiological process resulting in neurological impairments in response to a forceful impact directly on or transmitted to the head, neck, or face. Approximately 300,000 concussions occur in high school athletes in the US, making sports and to MVA as leading cause of concussions. Post-Concussion Syndrome (PCS) occurs when side effects are persistent past the 10 day period. 10% of people will develop PCS following a concussion.

Purpose

To describe physical therapy (PT) management and outcomes of a young athlete who sustained PCS.

Case Description

14 year old male referred to the outpatient setting for evaluation and management of symptoms related to concussion 4 weeks post injury. Presenting chief complaint was pain and dizziness. He presented with sensory, muscular, and cognitive complaints including pain with all cervical range of motion (ROM), pronouned forward head and rounded shoulder posture, muscle guarding at bilateral cervical musculature, and pain with all cervical range of motion (ROM).

Dizziness Handicap Inventory (DHI), Post-Concussion Syndrome inventory (PCSI), Balance Error Scoring System (BESS) and Blake Treadmill protocol used for outcomes measurement.

Interventions

Manual Therapy
- Soft Tissue Mobilization
  - Sub-Occipital
  - Erector Spinae
  - Joint Mobilization (A-P, traction)
  - Grade II and III occupit- Cs Segment

Therapeutic Exercise
- Theraband Rows
- Theraband Pull-downs
- "No-monies"

Neuromuscular Re-Education
- Vestibular Rehabilitation
  - Head updown, side-to-side
  - Non-compliant/Compliant surfaces
  - Dynamic VOR training
  - Balke Treadmill Protocol

Outcomes

HR Tolerance

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<th>Initial Examination</th>
<th>Discharge</th>
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Standardized Outcome Measures

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<tr>
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Outcomes Continued

Observation and Palpation
- Reduced rounded shoulder and forward head
- Normalized muscle tone
- Reduced muscle guarding

AROM
- Full Cervical ROM without pain

Vestibular Tests
- Negative smooth pursuits, saccades, and VOR rapid head thrust

Pain Scales
- Worst: 1/10
- Best 0/10

Discussion

Returned to PLOF following his 9 PT treatment encounters through cervical re-education and vestibular rehabilitation.
- Reduced hypertonicity in deep and superficial musculature
- Significantly reduced number and intensity of headaches experienced
- Improved heart rate tolerance to activity
- This case report paralleled the outcomes of current evidenced based return to sport literature on PCS

Further research: specific length of treatment needed to return the patient to sport and the reliability and validity of the Balke treadmill protocol test as it pertains to PCS

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References