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.
- 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
- Relevant clinical findings include:
  - Persistent headaches
  - Dizziness
  - Blurred vision
  - Pronounced forward head and rounded shoulder posture
  - Muscle guarding at bilateral cervical musculature
  - 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 measures
- Vestibular testing: smooth pursuits, saccades, vestibular ocular reflex (VOR) head thrust
- Plan of care: manual therapy, postural re-education, therapeutic exercise and vestibular rehabilitation 2x per week for 6 weeks

Interventions

- Manual Therapy
  - Soft Tissue Mobilization
    - Sub-Occipital
    - Erector Spinae
    - Joint Mobilization (A-P, traction)
    - Grade II and III occiput-C1 Segment
- Therapeutic Exercise
  - Theraband Rows
  - Theraband Pull-downs
  - "No-monies"
- Vestibular Rehabilitation
  - Head up/down, side-to-side
  - Non-compliant/Compliant surfaces
  - Dynamic VOR training
  - Balke Treadmill Protocol

Outcomes

- HR Tolerance
- Standardized Outcome Measures

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