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Athletic Headaches

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The athlete may present with a complaint of headaches in three ways: (1) headaches unrelated to athletic activity; (2) headaches that are exertion/activity related; and (3) posttraumatic. The first category of presentation is evaluated and managed like non-athletic presentations. Exertional and post-traumatic headaches are often acute events which require immediate triage. On-the-field evaluation is limited but can provide a reasonable basis for decision making with regard to return-to-play or referral for further evaluation.

Exertional/Activity Related Headaches

One of the major concerns with exertion related headache is the possibility of an underlying tumor or vascular weakness which may lead to sudden death. Although 50-60 percent of patients with brain tumors have headaches, only 2-25 percent experienced exertion-related headaches.¹ When aneurysms rupture, a quick onset of headache followed by loss of consciousness and death is the usual scenario. However, in patients with an aneurysm that is slowly hemorrhaging, a severe headache may appear over several days or weeks. This "sentinel" headache appears in 30- 60 percent of patients with eventual rupture.² Associated symptoms may include nausea, vomiting, visual disturbances and photophobia, aphasia, nuchal rigidity (without fever), and weakness. Immediate referral is necessary. Evaluation will include a CT for structural brain lesions and a lumbar puncture to detect a subarachnoid bleed.

It is important to screen athletes regarding some common culprits of benign exertional headaches including dehydration, hyperventilation, hypoglycemia and/or poor diet, alcohol use, caffeine withdrawal, and heat intolerance. These are more likely to be triggering mechanisms in the poorly conditioned athlete. When headache is associated with a specific activity, clues may be found with regard to the mechanism in some cases. For example, one common presentation is "weightlifter's" headache.³ There are probably two possible explanations for this occurrence; (1) increased intracranial pressure is caused by the Valsalva-like

maneuver with lifting, and (2) stretching or strain of cervical musculature/tendons.

Valsalva maneuvers increase intracranial venous sinus pressure. This in turn leads to a general increase in intracranial pressure which reduces cerebral blood flow. This effect is generally short lived and benign. If persistent or severe, further evaluation with CT or MRI may be necessary. Overstrain due to maximum lift effort or abnormal posturing of the neck during activity may lead to a primarily subluxation/soft-tissue caused headache. Historical review of the mechanism of onset with regard to neck position and the onset of symptoms is valuable. Confirmation by physical examination, spinal palpation, and resolution with chiropractic care are likely with this etiology.

Migraine headaches occur with some athletes involved in short, strenuous activities including weightlifting, and short distance running or swimming.⁴ Although the mechanism is not clear, it has been proposed that hyperventilation leads to a decrease in Pco₂ with resulting vasoconstriction. This leads to a migraine aura followed by vasodilation leading to the headache.

Acute altitude change from 3,500-5,000 meters may lead to acute mountain sickness which presents as a throbbing headache often associated with malaise, nausea, and vomiting in some cases.⁵ The onset is generally within the first three days after ascent. After several days of acclimation, the headache resolves.

A distinct subcategory of sport-related headaches is found in divers.⁶ There are a variety of mechanisms to consider:

- Skip breathing may lead to increased Pco₂, vasodilation, and subsequent headache.
- Cervical and facial muscles may be overstrained through stabilizing the mouthpiece.
- A tight mask may compress the supraorbital and supratrochlear nerves.
- Dental cavities may be sensitive to the barometric pressure changes with deep diving.

Posttraumatic Headaches

In collision or contact sports head and neck trauma are common. With direct trauma to the head varying degrees of injury may occur including cerebral contusion, sub- or epidural hemorrhage/hematoma, and intracranial artery dissection. Although it may seem logical that when damage is severe headache would be immediate. Slow leaks however may take several hours or days (rarely weeks) to cause significant symptomatology. It would be prudent though to check all athletes with head trauma for focal neurologic signs (in particular cranial nerves) and mental status. It is beyond the scope of this brief article to address the grading systems for concussions and their recommendations (and conflicts), yet it is generally agreed that when there are signs of neurologic dysfunction and loss of consciousness (LOC), a CT or MRI (based on suspicion) should be performed.

When neurologic function is intact and there is no history of LOC, several headaches are possible. The first type is a nonthrobbing, persistent headache often felt in the frontal or occipital areas. It is often worse upon wakening with some resolution during the day, however worsening in the late afternoon. Unfortunately, this headache has been reported to last as little as months to as much as years.⁷ It would be interesting to determine the effects of chiropractic care on this subgroup of individuals. Perhaps the mechanism is more from an associated neck trauma.

Current theories regarding the association between the cervical spine and headaches suggests a spinal cord intersection between the nucleus of the spinal tract of the trigeminal nerve and the dorsal horn of the upper cervical spine (C1-C3). Because these two structures are indistinguishable, they are referred to as the trigeminocervical nucleus.⁸ Nociceptive input into this nucleus from the cervical spine ligaments, muscles, and joint capsules, may then be misinterpreted or "referred" to the head. Stated briefly, correction of the underlying cervical spine irritation may then relieve the headache.

A post-concussion migraine headache has been reported especially with soccer and English football.⁹ This type of migraine resembles the classic migraine (migraine with aura) and usually resolves within 48 hours. A strikingly different type of headache is one in which there are associated signs of pupillary dilation and sweating. In between attacks there may be a partial Horner's syndrome. This type of headache is sometimes called traumatic dysautonomic cephalgia and is thought to be caused by sympathetic fiber injury in the neck. The medical treatment is with beta-blockers.

Finally, an insidious and potentially life-threatening condition associated with head trauma and headache is the second-impact syndrome.¹⁰ Apparently an athlete who suffers with what appears to be minor head trauma which is not resolved when impacted by a second head injury. Rapid swelling caused by a failure of autoregulation of cerebral blood flow occurs with significant morbidity and, half of the time, death. The recognition of this condition has led to recommendations which are far more conservative than in the past. Common guideline recommendations include close observation of the athlete following head trauma and restriction from participation when there is loss of consciousness or persistent neurologic dysfunction.

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