Trigeminal Autonomic Cephalalgias (2004)

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Of all the different types of headaches, a special category causes unusual symptoms caused by activation of the autonomic nervous system of the trigeminal nerve in the face, hence the name “trigeminal autonomic cephalalgia” (abbreviated TACs). These autonomic features include redness and watering of the eye (conjunctival injection and lacrimation), one-sided nasal congestion or discharge (rhinorrhea), forehead and facial sweating, constriction of a pupil, as well as drooping and swelling of an eyelid (miosis, ptosis and eyelid edema).

Cluster headache - Patients have recurrent attacks of severe one-sided pain in and around one eye or in the temple. The pain is steady, knifelike and burning, one of the most intense pains known to man. The pain lasts from 15 to 180 minutes, but occurs up to 8 times per day. The patients have some or all of the autonomic symptoms on the side of the headache. In the episodic form of cluster headache there may be daily attacks for a few weeks (clustering), followed by complete remission for weeks to years. The secondary chronic form, daily attacks without remission, eventually evolves from the episodic form in about 10%. However, the very rare primary chronic form begins with daily typical headaches that never remit. Cluster headache is fairly rare, estimated to afflict about 0.5% of the population, 10-40 times less common than migraine. It is predominantly a male disorder, with a male/female ratio of 5.6 to 1.

The mechanisms of the pain of cluster headache, as with all the TACs, are unknown - despite abnormalities demonstrated in the deep brain, in functional imaging and in a host of trigeminal autonomic functions. The attack probably is initiated by rapid firing of neurons in the hypothalamus, near the neurons responsible for setting autonomic rhythms such as sleep-wake cycle and body temperature.

There is typical behavior associated with the cluster pain. Patients pace about and cannot lie still. They carry out irrational, violent, self-destructive behavior.

Acute therapy for each attack is limited by the rapid onset and short, repetitive nature of the attacks. Analgesics are effective only if they have a very rapid onset, such as injectable narcotics. Inhalation of pure oxygen is effective in 75%. The best acute therapy is injectable sumatriptan, having been proven effective in a European multi-center trial, in which every patient responded. Zolmitriptan nasal spray may also be effective.

Preventive (prophylactic) therapy is the best treatment for cluster headache. Drugs of choice at present are the calcium-channel blockers, which offer the safest, most effective treatment. In the US, verapamil is the first choice, but the rest of the world relies on another calcium channel blocker, flunarizine. These drugs may provide up to 100% relief, and are effective in both episodic and chronic cluster. Other effective prophylactics, divalproex and lithium carbonate, can be effective as well. Newer drugs, such as topiramate, recently approved for migraine, may also help cluster, with less adverse effects. Corticosteroids may provide marked temporary improvement, but their benefits must be weighed against substantial risks, many of which are severe. Indomethacin, so useful in other TACs, is only occasionally helpful in cluster headache.
Drugs which have proven to be NOT helpful include antidepressants and beta blockers.

Deep brain stimulation may be very effective in selective intractable cases of chronic cluster, but significant adverse effects, including neurological damage or worsened pain, may occur.

Chronic paroxysmal hemicrania (CPH) is a disorder with attacks with the same characteristics of pain, associated symptoms and signs as cluster headache, but the attacks are much shorter and more frequent. Pain is side-locked, as in cluster headache, but occurs mostly in females, unlike cluster headache. The headaches are absolutely responsive to indomethacin.

Most attacks last 2 to 20 minutes, never more than 45 minutes, while frequency may be as high as 30 attacks in 24 hours. There is at least one autonomic sign or symptom on the painful side, including conjunctival injection, lacrimation or nasal congestion. Long lasting remission (clustering) is not seen, but the frequency, duration and severity of attacks are variable. Migraine features such as nausea/vomiting may rarely accompany attacks. The major diagnostic criterion is absolute effectiveness of indomethacin. The continuous, chronic stage may be preceded by an episodic stage similar to that seen in cluster headache.

SUNCT (Short-lasting, Unilateral Neuralgiform headache attacks with Conjunctival injection, Tearing, sweating, and rhinorrhea). SUNCT is a trigeminal autonomic cephalalgia which usually presents with a long clinical history of unilateral headache and eye pain, side-locked, with neuralgic pain paroxysms of short duration (15-60 sec), and high frequency (5-30 times per hour). The cause is unknown. Trigeminal autonomic symptoms and signs are severe, with intense conjunctival injection for the duration of the pains, massive lacrimation, forehead sweating and rhinorrhea, all on the symptomatic side. The attacks can be precipitated by jaw movements such as chewing, or eating or movements of the head and neck. The headache is completely refractory to drug therapy, including indomethacin.

Long-lasting autonomic symptoms with hemicrania (LASH) is the rarest of the TACs, and has been only recently described. Patients suffer attacks of autonomic symptoms such as ptosis, eyelid edema, lacrimation and nasal congestion which precede headache by 3 - 4 hours. This is then followed by severe side-locked headache, with continued autonomic symptoms. Unlike the other TACs, there are migrainous features like nausea, vomiting and photosonophobia. These attacks last much longer (1-3 days), and may occur at a frequency of once per week. Unlike migraine, these attacks are completely responsive to indomethacin, but show no response to verapamil, oxygen, sumatriptan or opiates.