

Cluster Headache Management With Methylphenidate (Ritalin)

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The authors report rapid cluster headache relief in a 43-year-old man with a 5-year history of refractory cluster headache. The patient described complete headache relief within 10 minutes of taking 10 mg of methylphenidate (Ritalin) when used to abort the onset of his headaches. Subsequently, a scheduled Ritalin dose taken each morning was sufficient to prevent his nightly headaches. In addition, 1 week of prophylactic methylphenidate therapy halted the series of cluster headaches. This is the first reported case of relief of cluster headaches with methylphenidate.

Key words: cluster headache, methylphenidate, Ritalin, sympathetic dysfunction

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The prevalence of cluster headache is low, estimated at about 70 per 100 000¹ with a marked male predominance. The pathophysiology of cluster headache remains unclear. Evidence indicates that the pathogenesis of cluster headache dysfunction may be in the cephalic sympathetic nervous system.²⁻⁴

Cluster headache is characterized by recurrent unilateral attacks of headache of great intensity and brief duration, often accompanied by local signs and symptoms of autonomic dysfunction.⁵ About 10% of patients have chronic symptoms. These headaches are often difficult to treat.⁶ Cluster head pain is often severe and rapidly reaches maximal intensity. The brief duration of the attacks dictates that to be of any practical use, a treatment must be effective within a few minutes after its administration. In spite of new treatment paradigms, some patients with cluster headache remain unresponsive to therapy.

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CASE HISTORY

This 43-year-old limousine chauffeur presented with a 5-year history of right-sided cluster headaches with a pattern of daily occurrence for 2 to 3 weeks, followed by a period of 3 months without headache. Due to its location in the jaw behind the ear, the headache was initially diagnosed as temporomandibular joint disease. When initially seen by the first author, the patient reported an ongoing cycle which began after drinking alcohol over the Christmas and New Year's holidays. For several weeks, the patient had been experiencing one to four cluster headaches per night and an occasional attack during the day. The headaches were described as "explosive" and were graded 9 to 10 in severity on a visual analog scale of 1 to 10. The quality of the head pain was reported to be throbbing, sharp, shooting, as well as aching. The pain was localized around the right eye, behind the right ear, and in the occipital region. Facial flushing, tearing, nasal stuffiness with rhinorrhea, ptosis, and conjunctival injection were associated with the headache.

The majority (95%) of the patient's headaches began at night and lasted from 30 minutes to 3 1/2 hours. Cheese, peanuts, and red wine were headache-inducing agents. The patient reported the practice of placing ice bags over his head, or rushing into the shower where head positioning and deep breathing techniques seemed to

relieve pain intensity perception. The day following the cluster headaches, he described himself as having very little energy and feeling "beat to death." His headaches had been largely unresponsive to standard cluster headache medical care that included sumatriptan. When initially evaluated, his treatment regimen included verapamil hydrochloride sustained-release oral caplets, 120 mg per day; etodolac extended-release tablets, 500 mg per day; and hydrocodone/acetaminophen, 5/500 mg every 4 to 6 hours during the cluster headache. His past medical history was significant for a history of hepatitis, anxiety, and depression. He smoked one to two packs of cigarettes per day. His physical and neurological examinations were normal. There was no anisocoria, nor any other indication of a partial Horner syndrome.

The pattern of autonomic deficit in the face of patients with cluster headache suggests dysfunction of the cephalic postganglionic sympathetic nervous system resulting in signs of sympathicoparesis, or possibly parasympathetic hyperfunction.^{4,7} The first author believed that a trial of a mild sympathetic stimulant might prove to be a useful treatment strategy. Methylphenidate was chosen since it had recently been found useful in the treatment of some patients with pain of sympathetic origin.⁸⁻¹⁰ After obtaining informed consent from the patient, a short trial of methylphenidate was initiated to assess its ability to abort cluster headaches. That night, the patient experienced two cluster headaches that were completely relieved within 10 minutes of taking Ritalin. The patient described the headache relief "like someone turning a light switch on and off."

All other headache medications were discontinued and several days later, the patient was administered nitroglycerin as a provocative agent to induce cluster headache.¹¹⁻¹³ Sublingual nitroglycerin (0.8 mg) resulted in the onset of his typical, markedly painful, right-sided, cluster headache. This induced headache was successfully relieved with orally administered methylphenidate (10 mg) within 10 to 15 minutes. The patient complained of feeling "washed out" once the headache was relieved.

Over the subsequent week, methylphenidate continued to successfully abort cluster headaches that occurred one or two times per night. When switched to a regimen of one morning dose of Ritalin SR, his nighttime headaches completely ceased and when the medicine was discontin-

ued 1 week later, the ongoing cluster headaches were no longer present.

COMMENTS

Methylphenidate hydrochloride is methyl α -phenyl-2-piperidineacetate hydrochloride, a mild central nervous system stimulant. The mode of action is not completely understood, but it presumably activates the brain stem arousal system and cortex to produce its stimulant effect.¹⁴ Ritalin is available as tablets of 5, 10, and 20 mg and Ritalin-SR as sustained-release tablets of 20 mg, both for oral administration.¹⁴

Although the primary indications for methylphenidate are the treatment of attention-deficit hyperactivity disorders and narcolepsy,¹⁴ it has previously been successfully used in the treatment of postoperative pain and vasoconstriction,¹⁵ cancer-associated pain,¹⁶⁻²¹ and pain in Parkinson disease.²² These reports suggest that oral administration of low- to medium-dose methylphenidate produces a potent and sustained analgesic effect on various pain states. Its mechanism of action in cluster headache is unknown. Kuczenski²³ and Geyer et al²⁴ showed that the primary effect of methylphenidate on the central nervous system is to amplify catecholaminergic transmission, but it also alters serotonergic function in the brain stem. Experiments by Cantello et al,²² using beta-adrenergic and serotonergic blockers showed that both the norepinephrine and serotonin systems were involved in the genesis of methylphenidate-mediated analgesia.

CONCLUSIONS

In this report, methylphenidate (Ritalin) successfully stopped a cluster headache provoked by nitroglycerin and halted a series of cluster headaches in our patient. The use of methylphenidate in this patient suggests that methylphenidate may have value in the management of cluster headaches. Although an interaction with the sympathetic nervous system is postulated, the mechanism by which Ritalin relieved the headaches is unknown.

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