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ORIGINAL ARTICLE

Transient Monocular Visual Loss Induced By Celecoxib: A Rare Adverse Effect

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ABSTRACT

Background: The cyclooxygenase (COX) enzymes are competitively inhibited by nonsteroidal anti-inflammatory medications (NSAIDs). COX enzymes come in two distinct isoforms, each of which is encoded by a separate gene and has its own expression pattern. The therapeutic anti-inflammatory impact of NSAIDs is obtained by inhibiting COX-2 activity, whereas the majority of the unwanted side effects are caused by inhibiting COX-1 activity. As a result, selective COX-2 inhibitors are thought to have fewer negative effects. Medical disciplines such as rheumatology and orthopedics routinely prescribe COX-2 inhibitors like Celecoxib for the management and control of acute and chronic pain. Celecoxib is a medicine that is thought to be safe. Celecoxib, like other NSAIDs, can have side effects, the most prevalent of which are to the gastrointestinal (GI), cardiac, and renal systems. Ocular problems, which are included in the prescribing label as a potential concern, are among the less usually reported adverse effects of Celecoxib. Blurred vision, conjunctivitis, cataracts, and eye pain are among the side effects. More uncommon ocular problems have been recorded, including acute temporary and even severe permanent vision impairment. To my knowledge, this is the first published study on Celecoxib-related monocular vision loss.

Keywords: Cyclooxygenase (COX) enzymes, Ocular problems,

INTRODUCTION

I present a 35-year-old female patient with a history of infection of the central nervous system (CNS) 12 years ago. This infection caused her left-sided upper and lower limb weakness, but she was able to use her upper limb and walk independently. In March 2019, the patient, who was in the third trimester of her pregnancy, attended a neurology clinic complaining of progressive pain in the right lower back and hip for the past two months. She was not given any painkillers at that time. A few days after delivery, the pain increased in severity to the extent that she was unable to walk unaided, and she started to use a wheelchair. A magnetic resonance imaging (MRI) of her lower back and pelvic was performed and showed diffused right hip sacroiliitis. Moreover, the inflammatory marker erythrocyte sedimentation rate (ESR) was elevated (35mm). The patient was referred to an orthopedic surgeon in April 2019 who prescribed her a Celecoxib 200 mg once daily. The patient started to improve with Celecoxib, the intensity of pain decreased and she was able to walk again. Nevertheless, after 10 days of Celecoxib treatment, the patient suffered an episode of a painless, total loss of vision in her right eye, lasted for 15 minutes. The episode resolved spontaneously before reaching the hospital. The patient was seen by an ophthalmologist within an hour of onset with a completely negative ophthalmological examination. The patient continued to use her Celecoxib as prescribed. Five days later, the patient experienced a similar episode, which lasted for 5 hours. She was assessed by an ophthalmologist two hours after she regained her vision, and once again, there were no abnormal findings. Accordingly, she was referred to a neurologist for further evaluation. Neurological examination showed no new findings compared to her baseline examination, which had taken place three weeks earlier to her visual episodes.

Both MRI of the brain and orbit and magnetic resonance angiography (MRA) of the brain were normal. Furthermore, a complete blood count and serum chemistries were within the normal limits. Other investigations, including vasculitis workup, were negative. Regarding medication use, the patient was only using Celecoxib at that time. As no reason was found for the acute temporary reduction in her vision, we decided that the patient discontinues Celecoxib and replaces it by acetaminophen. Interestingly, the patient did not experience any further vision problems during an observation period of 12 months following Celecoxib withdrawal.

DISCUSSION

NSAIDs have anti-inflammatory, antipyretic, and analgesic properties that can lead to a variety of side effects. This is due to the suppression of cyclooxygenase (COX) enzymes, which prevents arachidonic acid from being converted to prostaglandins, prostacyclin, and thromboxanes. COX-1 and COX-2 are two related isoforms of the COX enzyme that have the same catalytic activity and produce the same products. Because of changes in COX isozyme biology, such as transcript and protein stability, gene expression regulation, and the need for varying levels of hydroperoxide, each isozyme performs different biological roles. [1] Celecoxib is one of the COX-2 pharmacological class's most commonly given drugs. [2] The usage of Celecoxib has been linked to a variety of ocular side effects, including impaired vision, conjunctivitis, scotomata, and cataract. [2] The National Registry of Drug-Induced Ocular Side Effects once included 1006 reports on COX-2 inhibitor ocular side effects. [3] The collected data suggested that patients on Celecoxib experienced two prevalent side effects: impaired vision (238 cases) and conjunctivitis (71 cases). Other less common Celecoxib side effects include the formation of orange spots, a "jellybean-like patch of central vision loss," and temporary

and permanent visual loss. [4,5] The International Drug Monitoring Center also documented cases of permanent (n=37) and temporary (n=14) blindness linked to the use of selective COX-2 inhibitors (3). Approximately one-third of the occurrences of permanent blindness were linked to Celecoxib use, whereas the rest were linked to Rofecoxib use. [6]

Here, I report a unique case of monocular temporary visual loss after the use of Celecoxib. Except for one case, the previously reported cases of visual loss associated with Celecoxib use were binocular. This monocular case belongs to an old woman who suffered from a central black smudge in her right eye. In contrast to our patient who had no previous ocular complaints, that patient had a complicated ocular history in the affected eye, including a cataract, peripheral iridectomy, long-standing posterior vitreous detachment, herpes zoster associated with keratitis, and scarring in the affected eye.[4] Moreover, our patient had a complete vision loss in her right eye, whereas the previously reported case lost her vision only in the central area of her right eye. In the current case, the patient complained of blurred vision on and off between the two episodes of vision loss. Soon after each episode, the patient was seen and examined by ophthalmologists as well as the neurologist, who both reported no reference to her visual complaint. Similar to what was reported in the previous cases, the patient in this case also improved within two days of discontinuing Celecoxib. Additionally, during a one-year follow-up period, our patient did not experience any more episodes of vision loss.

Coulter et al postulated a reason for the ocular complaints that some COX-2 inhibitor users suffer. Cyclooxygenase inhibitors presumably facilitate the formation of prostacyclin and other vasoactive prostanoids, which inhibit COX-1 or COX-2; hence, inhibition of the cyclooxygenase pathway may modify the regulation of retinal blood flow, potentially leading to vision abnormalities. [3] Another probable mechanism is that Celecoxib is a sulfonamide-containing medicine, which is known to cause visual side effects in the form of transitory myopia. This mechanism is unknown, although it may involve forward rotation of the lens-iris diaphragm, lenticular swelling, and ciliary body swelling, all of which cause greater curvature of the lens surfaces and accommodation spasm. As a result, the sulfonamide characteristic of these COX-2 inhibitors may play a role in some cases of impaired vision. [3,7] Additional processes have also been hypothesized, such as impacts on leukotriene production and chloride transport, which affect fluid movement through the retinal pigment epithelium and cause visual abnormalities. [8]

Prescribers should be alert about the possibility of ocular adverse effects of Celecoxib, even it is rare. If visual disturbances occur, Celecoxib should be promptly withdrawn, and the patient should be assessed for response, in particular, the resolution of visual symptoms. For patients in whom a severe visual disturbance has occurred, avoiding the future exposure to the causative NSAID, and even the other NSAIDs, is recommended.

CONCLUSION

Although rare, Celecoxib use can be associated with monocular or binocular visual loss. In patients presenting with acute visual disturbances while on Celecoxib, immediate withdrawal is essential and recommended.

Patient consent

Written informed consent was taken from the patient.

Competing interest

None.

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