CASE REPORT

Acute Esotropia in the Setting of Heroin Withdrawal

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INTRODUCTION

An inward deviation of one or both eyes is called esotropia. It can be seen in a variety of settings including nerve palsies (e.g. 6th nerve), structural restriction of eye movements (e.g. thyroid diseases), autoimmune diseases (e.g. myasthenia gravis), but can also be idiopathic.[1] The onset of esotropia can be very relevant in patients with brain tumors as it sometimes suggests a rise in intracranial pressure.[2] Ocular deviations resulting from nerve palsies or a defect of extraocular muscles that vary with the direction of gaze are called 'incomitant', while those that don't change with the direction of gaze are called 'comitant'.[3] Acute esotropia tends to occur in 30 % of people with opioid withdrawal and can result in significant temporary disability due to the double vision. Usually, these esotropias resolve in 6-10 weeks. This condition does not warrant any intervention apart from symptomatic management of diplopia by prismatic corrections and continued abstinence from opioids. We report a case of sudden appearance of esotropia in a patient during withdrawal from heroin usage.

CASE PRESENTATION

A 34-year-old white male with hepatitis C infection and heroin drug abuse presented to emergency room with double vision for the past six days. The double vision was persistent and did not have any diurnal variation or worsening with fatigue. The patient was in drug rehabilitation for two weeks before his presentation. Of note, he had similar symptoms when he was going through heroin withdrawal in the past. On neurological examination, the right eye was noted to be eso-deviated at rest in forward gaze. There was, however, no gaze restriction in all the other cardinal directions. Magnetic resonance angiography and imaging of the brain was unremarkable for any aneurysm or stroke. His comprehensive drug screen was positive for heroin and marihuana. A follow-up physical examination was not possible as the patient did not keep his outpatient clinic appointment. A follow up phone interview with him, however, confirmed the resolution of his double vision.

DISCUSSION

Acute onset esotropia is very rare. Its appearance during childhood or gradual development later in life needs to be addressed carefully for underlying pathology. When it comes to heroin withdrawal, signs and symptoms typically start within 6 to 10 hours after the last dose and peak within 2 to 4 days. Acute esotropia may present later than the well-known

symptoms of withdrawal.[1] This phenomenon was first observed in soldiers returning from Vietnam.[4] In fact, vision problems including diplopia were reported with many drugs of abuse. Many hypotheses were proposed to explain the development of acute esotropia in heroin withdrawal patients. The currently widely accepted one is the 'Disuse Atrophy' of the motor fusion system. It involves heroin-induced miosis causing an increased depth of focus followed by a lesser need for accommodative correction.[5]

Some studied the orthoptic status before and after heroin withdrawal in patients undergoing five-day detoxification program. Before detoxification, most of the patients showed an exo-deviation at distance and after detoxification showed an eso-deviation suggesting that heroin use is associated with exotropia[6,7] while its withdrawal is associated with esotropia.[4,8] Hyperopic-cycloplegic refraction is a risk factor for the development of esotropia with heroin withdrawal.[4] Another interesting point is that rapid withdrawal using naltrexone results in a higher incidence of esotropia than using methadone. The three main things that play a role in the pathology of esotropia in heroin withdrawal patients are the pupillary constriction, accommodation, and vergence[4]. Another explanation for this in association with heroin withdrawal is a sudden parasympatholytic state with a pupillary dilation and paralysis of the ciliary muscle resulting in decompensation of fusion leading to esotropia.[9]

Opiate receptors are located in the pretectal area, superior colliculus and ventral nucleus of the lateral geniculate body.[2] Opioid receptors are identified in the ganglion cell layer of retina and withdrawal from opiates affects the rate of firing of these cells. It has been hypothesized that there is a direct involvement of midbrain neurons causing acute concomitant esotropia and that cells involved in near-far response are affected, and the equilibrium between convergence and divergence is altered.[8] One study found a much higher prevalence of strabismus in children exposed to opiates antenatally than in the general population. However, due to multiple confounding factors it is not possible to attribute a causal relationship. Maternal cigarette smoking is also a significant risk factor for the development of esotropia.[10]

Initially, the diplopia is treated by prismatic correction and if it persists botulinum injection of the medial rectus muscle and strabismus surgery are other options. Pilocarpine eye drops can also provide symptomatic relief. Occlusion of one eye should be avoided as this may encourage decompensation and can result in persistent deviation.[3]

CONCLUSION

Acute onset of concomitant esotropia presenting with diplopia can be seen in the setting of heroin withdrawal. We report a case of acute esotropia in a young white male during heroin withdrawal. A sudden onset of eye deviation is usually considered an ominous sign and patients are subjected to a multitude of diagnostic tests and investigations. Acute esotropia in the setting of heroin withdrawal is typically self-limiting. This case presentation can increase the awareness among physicians for a timely diagnosis, and prevent unnecessary diagnostic testing and further consultations.

Notes

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