Case Report

Anosmia after Caudal Epidural Steroid Injection

Ayhan Kaydu, Ebru Tarikçi Kiliç¹, Erhan Gökçek¹, Cem Kivilcim Kaçar²

Department of Anesthesiology, Diyarbakir Selahaddin Eyyubi State Hospital, ¹Department of Anaesthesiology and Reanimation, Health Sciences University, Ümraniye Training and Research Hospital Istanbul, Turkey, ²Department of Anaesthesiology, Diyarbakir Training and Research Hospital, Diyarbakir, Istanbul, Turkey

Abstract

There are no reports for anosmia after caudal epidural steroid injections (CESIs). General anesthesia is among the reasons, but the reports up to date are extremely limited. There are no identifiable factors contributing to anosmia after epidural injection, so it is worth discussing. We present the case of a 50-year-old woman with no previous history of any sensory deficits. She experienced anosmia after CESI that had been performed due to her chronic low back pain and lasted for 4 months. Clinical and imaging studies did not reveal any pathology. After 4 months, the olfactory dysfunction demonstrated a significant improvement. Disorders of the olfactory system are unknown after regional anesthesia. The onset of the dysfunction in correlation with the imaging findings may indicate that anesthetics can affect the olfactory dysfunction. Further studies are needed.

Keywords: Anosmia, caudal epidural steroid injection, olfactory dysfunction

INTRODUCTION

Inflammation of the nerve roots leads to low back pain. Chronic low back pain (CLBP) can be treated with an alternative pain management such as caudal epidural steroid injection (CESI). The injection procedure is a simple outpatient procedure with long-term pain relief. There are few risks associated with this procedure. Reported side effects seen after epidural steroid injections (ESI) are headache, back pain, and increase in blood sugar levels for diabetic patients. Rare side effects that may occur include weakness, dizziness, fatigue, skin changes, and osteoporosis.[1]

Extremely rare risks are infection, bleeding, dural puncture, nerve damage, and hiccups. Based on available literature, the recommendations for anesthesiologists caring for patients at risk for this occurrence are presented in this case. The symptoms are usually temporary as, in the majority of the patients, the sensory receptor cells are able to regenerate themselves after injury. After getting the patient’s written consent, we present anosmia persisted 4 months after CESI.

CASE REPORT

A 50-year-old woman referred to our pain clinic due to her persistent CLBP. Analgesics and physiotherapy did not relieve her pain for years. She rejected surgery. She was offered ESI by a neurosurgeon and she chose conservative management. CESI was planned. Informed consent was obtained after explaining the risks. Hypertension was documented as patient’s medical history for 5 years. Her medical history included only multivitamin. She reported no allergy. She did not have any anesthetic or surgical history. The patient was put in prone position with a cushion under the abdomen in the operating room. Under sterile conditions, following the local anesthesia, the procedure involved an 18-gauge epidural needle through the sacral hiatus. After negative aspiration for blood and cerebrospinal fluid, totally, 20 ml of drug mixture of celestone 12 mgr (2cc) and bupivacaine 15 mgr (3cc) and 15 ml saline solution was carefully administered. In the recovery room, hemodynamics was stable. Her leg strength was normal, and her pain score had dropped from 8 to 2. Postoperative recovery was uneventful. The assessment in the pain clinic was unremarkable. A week later, she noticed a sense of smell loss. She was unable to smell foods and flowers.

Address for correspondence: Dr. Ebru Tarikçi Kiliç, Department of Anaesthesiology, Diyarbakir Training and Research Hospital, Diyarbakir, Turkey.
E-mail: ebru.tarck@yahoo.com

This is an open access journal, and articles are distributed under the terms of the Creative Commons Attribution-NonCommercial-ShareAlike 4.0 License, which allows others to remix, tweak, and build upon the work non-commercially, as long as appropriate credit is given and the new creations are licensed under the identical terms.

For reprints contact: reprints@medknow.com

How to cite this article: Kaydu A, Kiliç ET, Gökçek E, Kaçar CK. Anosmia after caudal epidural steroid injection. Anesth Essays Res 2018;12:291-3.
The patient’s quality of life significantly decreased. She was referred to the ear-nose-throat department urgently. Physical testing showed anosmia. There had been no olfactory disorder, chronic rhinosinusitis, allergy, or any other olfactory diseases. She denied acute sinusitis or neurologic symptoms of note. Her medical history was free of neurodegenerative diseases. The patient had a complete otorhinolaryngological examination including nasal endoscopy. The clinical evaluation did not reveal any nasal pathology. The neurosurgeon consulted and assessed the results with computed tomography (CT). CT scan showed normal anatomical structures [Figure 1a-c]. There was no evidence of intracranial hemorrhage. Any other central nervous pathologies were not detected. The nasal and paranasal cavities were free of pathology with olfactory clefts in both sides. Sniffin stick tests were performed by otolaryngologists. This test has been extensively validated and comprises three subtests: a test of olfactory threshold, an odor discrimination task, and an odor identification test. The patient yielded 26.5 points, which represents a score within the lower normal range. The results verified the anosmia, unfortunately.

At the follow-up 4 months later, the patient’s olfactory functions improved.

**Discussion**

Upper respiratory infections, head trauma, and neurodegenerative disorders are common causes of olfactory illnesses. Viral infections leading to upper respiratory infections and sinonasal diseases are responsible for olfactory loss.[2,3]

In our report, the patient had no medical history of olfactory disorder. Anosmia after CESI has not been reported up to date. The reason and the mechanism are not known. The possible mechanism of anosmia can be explained by the volume effect because this may change the balance of the cerebrospinal fluid volume, pressure, and flow so that anosmia can start as a response.[4,5] We assume that dural sac is compressed as a result of caudal injections. Dural compression lasts at least 30 min after injection, and the changes of the cerebrospinal fluid lead to these complications.

Kaydu et al. reported persistent hiccups after CESI who recovered with medical treatment. They stated one of the reasons as volume affect.[6]

There is a potential risk for olfactory impairment after general anesthesia, especially after the surgeries of brain, head, and neck. However, in these cases, it is difficult to confirm a cause and effect relationship as surgery, anesthetics, and the olfactory system.

Olfactory receptors in the nose, olfactory nerves, olfactory bulbus, and olfactory region of brain control the perception of smell. General anesthesia suppresses the neuronal signal conduction reversibly. Clinical studies showed that sevoflurane and propofol affect on olfactory bulbs. Anesthetic agents can affect the olfactory system of the pathway.[7]

In our case, there may be a leak through the cisterna magna the opening in the subarachnoid cavity. The reason can be the high volume given into the subarachnoid space and the mass effect on the olfactory system. The loss of smell was not due to the mechanical injury. Anosmia was not accompanied by other neurological deficits. The breathing, blood pressure, and heart and respiratory rate were not changed. Her recovery was gradual and without medical support in 4 months.

**Conclusion**

The present case report raises questions about potential olfactory impairment due to regional anesthesia. Further experimental studies are needed to assess the effects of CESI on olfaction. To the best of our knowledge, no report exists in the literature regarding the effect of regional anesthesia on olfaction. Anesthesiologists ought to be aware of this phenomenon so that they may be able to reassure patients and avoid anesthetic techniques associated with anosmia.

**Declaration of patient consent**

The authors certify that they have obtained all appropriate patient consent forms. In the form, the patient has given his consent for his images and other clinical information to be reported in the journal. The patient understand that name and initials will not be published and due efforts will be made to conceal identity, but anonymity cannot be guaranteed.

**Financial support and sponsorship**

Nil.
Conflicts of interest
There are no conflicts of interest.

References
1. Abbasi A, Malhotra G, Malanga G, Elovic EP, Kahn S. Complications of interlaminar cervical epidural steroid injections: A review of the literature. Spine (Phila Pa 1976) 2007;32:2144-51.
2. Seiden AM, Duncan HJ. The diagnosis of a conductive olfactory loss. Laryngoscope 2001;111:9-14.
3. Malaty J, Malaty IA. Smell and taste disorders in primary care. Am Fam Physician 2013;88:852-9.
4. Beyaz SG. Persistent hiccup after lumbar epidural steroid injection. J Anaesthesiol Clin Pharmacol 2012;28:418-9.
5. Higuchi H, Adachi Y, Kazama T. Effects of epidural saline injection on cerebrospinal fluid volume and velocity waveform: A magnetic resonance imaging study. Anesthesiology 2005;102:285-92.
6. Kaydu A, Kılıç ET, Gökçek E, Akdemir MS. Unexpected complication after caudal epidural steroid injection: Hiccup. Anesth Essays Res 2017;11:776-7.
7. Dhananni NM, Jiang Y. Anosmia and hypogeusia as a complication of general anesthesia. J Clin Anesth 2012; 231-3.