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STELLATE GANGLION BLOCK FOR TREATING POST-COVID IMPAIRMENT OF TASTE AND SMELL

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Background: The loss of smell and taste are some of the chronic complications that have impacted and continue to impact patients who suffered a COVID-19 infection. Impairment of smell and taste have significant impact on patients' lives. Current treatment modalities are very limited.

Case Report: We present a 40-year-old patient who completely lost smell and taste following a COVID-19 infection. The patient was treated with bilateral stellate ganglion blocks (SGBs) where each side was blocked at separate visits. At the 6-month follow-up, taste and smell both improved by 90%.

Conclusions: SGBs should be considered as an option in treating loss of smell and taste in patients who suffer this complication as a result of COVID-19 infection.

Key words: COVID-19, smell, taste, chronic COVID infection

BACKGROUND

In the wake of the COVID-19 pandemic, the medical community has been faced with a multitude of challenges. One such challenge is the emergence of various neurological manifestations (1), which has gained increasing attention among researchers and clinicians. Among these neurological manifestations, alterations in taste perception have emerged as a prominent and distressing symptom reported by a significant proportion of individuals infected with the SARS-CoV-2 virus. Anosmia (loss of smell) and dysgeusia (distorted or altered taste) have been identified as hallmark features of COVID-19, frequently occurring before any other symptoms appear and persisting long after the virus has cleared (2).

Several theories about the etiology of olfactory impairment have surfaced as the number of cases with taste perception impairment has increased. These include downregulation of olfactory receptor proteins, direct viral invasion of the olfactory bulb, injury to cells that support the sustentacular structure, inflammation and blockage of the olfactory cleft, and damage to central nervous system circuits or structures that may be caused by a widespread activation of cytokines. It has also been investigated if these alterations in the quantity or composition of nasal mucus, along with the blockage of odorant transit from local airway inflammation to the olfactory receptors, may be a pathophysiological mechanism of altered taste perception linked to COVID-19 (3-5).

Researchers are exploring alternative therapies to address COVID-19-associated taste problems. Stellate ganglion blocks (SGBs), a well-researched modality mostly used in pain management, represent one of these lines of exploration. The rationale for utilizing SGBs in the context of taste abnormalities linked to COVID-19 is based on the complex relationship that exists between gustatory perception and sympathetic nervous system activity.

The stellate ganglion regulates the sympathetic nervous system's influence on different parts of the body

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like blood vessels, salivary glands, and sensory organs. It is believed that reducing sympathetic activity through SGBs might have a positive effect on taste sensation by improving taste disturbances that people may experience after recovering from COVID-19 (6).

While there is a basis supporting the use of SGBs (6-8), there is currently limited empirical evidence available for the use in this situation. Few studies have delved into the effectiveness of SGBs for taste disorders related to COVID-19, and the existing data mainly come from accounts and small case studies. This gap in the literature highlights a need for insight into the practicality and results linked to this innovative treatment method.

This case report will discuss a patient diagnosed with COVID-19 who complained of anosmia and dysgeusia, which was effectively managed with SGBs. Through this case report, we will thoroughly examine the mechanisms, clinical evidence, and potential effects of SGBs in addressing taste problems due to COVID-19.

CASE PRESENTATION

A written consent was obtained from the patient for publication of this case report.

Our case is a 40-year-old man who is a chronic pain patient that suffers from lumbar radicular pain, which was treated using different modalities including physical therapy, gabapentin, duloxetine, and low-dose naltrexone. The patient also receives steroid injections and has a spinal cord stimulator placed for the management of his pain. The patient's lumbar radicular pain was effectively controlled with these modalities. In 2021, he suffered from a COVID-19 infection. Following the infection, the patient developed psychosis, headaches, and complete loss of taste and smell. In January 2024, the patient received bilateral SGBs, with each side being done at separate appointments 3 weeks apart.

Blocks were done under fluoroscopic guidance at the C6-C7 level, and medications used included 10 mg dexamethasone and 10 mL bupivacaine 0.375% with epinephrine. Before injecting any medications, contrast was used to ensure appropriate spread and lack of any vascular injection. Temperatures were monitored, and with each block, there was > 10° increase in temperature following injections.

At the 6-month follow-up, our patient reported 90% improvement in taste and 90% improvement in smell. Those results are based on qualitative testing performed by giving the patient different smells to identify and the patient's personal experience.

DISCUSSION

Anosmia and dysgeusia have emerged as indicators of a COVID-19 infection (2). These symptoms often manifest early in the illness, sometimes preceding signs, and may persist after the acute phase subsides. The pathophysiological mechanisms behind anosmia and dysgeusia in COVID-19 are complex and not fully understood (4). Several factors may contribute to these symptoms, including invasion of olfactory and gustatory cells, inflammation-induced damage to tissues, disruption of neural pathways responsible for smell and taste perception, and broader effects such as cytokine imbalances and neuroinflammation triggered by the virus (3-5).

Addressing anosmia and changes in taste perception due to COVID-19 is important as these issues can significantly affect an individual's quality of life. In this context, alternative treatments, such as SGBs, have been implemented as an option for managing COVID-19-related taste disorders.

While SGBs are commonly used to manage pain (9,10), they have recently gained attention as a treatment option for taste disturbances associated with COVID-19. The efficacy of SGBs in addressing taste issues is backed by the relationship between taste perception and the activity of the sympathetic nervous system. By administering SGBs to patients recovering from COVID-19, it is possible to regulate sympathetic activity and alleviate taste abnormalities (6-8).

In the case of anosmia, disruptions in activity controlled by the stellate ganglion may contribute to changes in olfactory function (8). The sympathetic nervous system plays a role in controlling blood flow to nasal tissues and regulating nasal mucus production, both of which are essential for olfactory function. This highlights the potential benefits of using SGBs in treating anosmia, especially when there is excessive sympathetic activity involved in smell-related issues. SGBs offer a way to adjust function and potentially reduce inflammation to address cases of anosmia and dysgeusia (11,12). However, further research is required to fully understand the effectiveness, safety, and long-term outcomes of this approach. This knowledge would help in managing taste and smell disturbances associated with COVID-19.

In our patient, who presented with refractory taste and smell disturbances after acquiring COVID-19 in 2021, SGBs and steroids were used to address his symptoms related to sympathetic dysregulation.

Steroids are known for their anti-inflammatory properties and have been used in various medical situations to decrease tissue inflammation and relieve symptoms caused by immune-related processes. The use of steroids alongside SGBs in this patient was aimed at reducing inflammation and regulating immune responses, potentially enhancing the effectiveness of this procedure. By targeting inflammatory pathways involved in COVID19--related taste problems, steroids might work together with SGBs to manage symptoms more effectively.

After receiving SGBs with steroids, the patient experienced a notable improvement in his sense of taste and smell. There was a 25% improvement of symptoms after he was treated with an SGB on the left side and complete recovery following the treatment of the right side. This positive response highlights the potential effectiveness of this treatment in addressing taste changes linked to COVID-19, emphasizing the importance of exploring different treatment options for challenging cases.

CONCLUSIONS

SGBs offer a promising treatment option for managing taste disorders linked to COVID-19. By targeting sympathetic dysregulation and inflammation involved in these disorders' development, SGBs present a new approach to symptom management for challenging cases. However, additional studies are required to determine the effectiveness, safety, and long-term outcomes of this treatment approach for better understanding and management of taste disturbances associated with COVID-19.

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