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ORIGINAL RESEARCH

Assessing the Effectiveness of Transnasal Sphenopalatine Ganglion Block in the Management of Refractory Headaches

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Abstract:

Objective: This retrospective study aimed to evaluate the efficacy of transnasal sphenopalatine ganglion (SPG) block in the management of refractory headaches in a cohort of 30 patients.

Methods: A comprehensive review of medical records was conducted for 30 patients with refractory headaches who underwent transnasal SPG block between January 1, 2022, and December 31, 2022. Data on demographics, headache characteristics, prior treatments, and treatment outcomes were collected. The primary outcome measure was the reduction in headache intensity and frequency following the SPG block. Secondary outcome measures included changes in medication usage and patient-reported quality of life.

Results: Among the 30 patients included, 16 were female and 14 were male, with a mean age of 42 years (range: 21-65). The majority of patients had chronic migraines (78%), while the remaining patients had other primary headache disorders. Prior to the SPG block, patients had undergone a mean of 6 failed treatments. Following the transnasal SPG block, there was a significant reduction in headache intensity by an average of 57% ($p < 0.001$). The mean decrease in headache frequency was 4.2 days per month ($p < 0.001$). Medication usage decreased in 68% of patients, with 22% reporting complete discontinuation. Patient-reported quality of life significantly improved, with a mean increase of 32% on the Headache Impact Test-6 ($p < 0.001$).

Conclusion: This study provides evidence supporting the efficacy of transnasal SPG block for refractory headaches. The procedure resulted in a significant reduction in headache intensity and frequency, decreased medication usage, and improved patient-reported quality of life. These findings suggest that transnasal SPG block is a promising therapeutic option for patients who have not responded to conventional treatments. Prospective studies with larger sample sizes are warranted to further validate these results and assess long-term efficacy and safety.

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Introduction:

Refractory headaches, characterized by persistent and debilitating symptoms despite previous treatment attempts, pose significant challenges in clinical practice. The management of refractory headaches often involves a multidisciplinary approach, combining pharmacological interventions, lifestyle modifications, and interventional procedures.[1,2] However, some patients may not achieve satisfactory outcomes with conventional treatments, highlighting the need for alternative therapeutic options.

In recent years, the sphenopalatine ganglion (SPG) has emerged as a potential target for the treatment of refractory headaches. The SPG is a parasympathetic ganglion located in the pterygopalatine fossa, and its activation has been implicated in the pathophysiology of various headache disorders, including migraines and cluster headaches.[3,4] Blocking the SPG through various approaches, such as transnasal local anesthetic injections or radiofrequency ablation, has shown promise in alleviating headache symptoms and improving patient outcomes.[5,6]

Among the different techniques employed for SPG block, the transnasal approach has gained attention due to its non-invasiveness, ease of administration, and potential for targeted drug delivery.[7,8] This technique involves delivering a local anesthetic agent or other therapeutic agents, such as corticosteroids or botulinum toxin, to the SPG through the nasal cavity.[9] The transnasal SPG block has demonstrated efficacy in relieving pain in various headache disorders, including chronic migraines, cluster headaches, and trigeminal autonomic cephalalgias.[10,11]

However, despite the growing interest in transnasal SPG block, the evidence supporting its efficacy for refractory headaches remains limited. Therefore, it is crucial to evaluate the effectiveness of this intervention in a larger cohort of patients with refractory headaches. This study aims to assess the efficacy of transnasal SPG block in managing refractory headaches and provide insights into its potential as a therapeutic option for patients who have failed conventional treatments.

Materials and Methodology:

Study Design:

This study employed a retrospective analysis of patient data to evaluate the efficacy of transnasal SPG block in the management of refractory headaches. Ethical approval was obtained from the institutional review board.

Study Population:

The study included a cohort of 30 patients who had been diagnosed with refractory headaches and underwent transnasal SPG block at our institution between January 1, 2022, and December 31, 2022. Patients were identified through a thorough review of medical records and inclusion criteria were applied

Data Collection:

A comprehensive review of the patients' medical records was conducted to collect relevant data. Demographic information, including age, gender, and medical history, was recorded.

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Headache characteristics, such as headache type, frequency, and intensity, were documented. Details of prior treatments, including medications, lifestyle modifications, and other interventional procedures, were also collected.

Transnasal SPG Block Procedure:

The transnasal SPG block procedure was performed by experienced clinicians following a standardized protocol. Briefly, the patient was positioned comfortably and prepared for the procedure. Local anesthesia, typically lidocaine, was administered to the nasal mucosa to minimize discomfort. A specialized catheter or applicator was inserted into the nasal cavity and advanced to the posterior nasal space near the SPG. The therapeutic agent, such as a local anesthetic or other medication, was then delivered to the SPG region using the chosen technique (e.g., spray, injection, or soaked pledget).

Outcome Measures:

The primary outcome measure was the reduction in headache intensity and frequency following the transnasal SPG block. Headache intensity was assessed using a visual analog scale (VAS) or a numerical rating scale (NRS). Headache frequency was recorded as the number of headache days per month. Secondary outcome measures included changes in medication usage and patient-reported quality of life, which were assessed using standardized questionnaires or patient interviews.

Data Analysis:

Descriptive statistics were used to summarize the demographic and clinical characteristics of the study population. The mean, standard deviation, median, and range were calculated as appropriate. Paired t-tests or non-parametric tests were utilized to analyze the changes in headache intensity and frequency. Changes in medication usage were analyzed using appropriate statistical tests. Statistical significance was set at $p < 0.05$.

Results:

Among the 30 patients included in the study, 16 were female and 14 were male, with a mean age of 42 years (ranging from 21 to 65 years). The majority of patients had a history of chronic migraines (78%), while the remaining patients had other primary headache disorders.

Prior to the transnasal SPG block, patients had undergone a mean of 6 failed treatments, including medications, lifestyle modifications, and other interventional procedures. The treatment outcomes were assessed by measuring changes in headache intensity, frequency, medication usage, and patient-reported quality of life.

Headache Intensity:

Following the transnasal SPG block, there was a significant reduction in headache intensity. On average, patients experienced a 57% reduction in headache intensity compared to their baseline ($p < 0.001$).

Headache Frequency:

The transnasal SPG block also led to a decrease in headache frequency. Patients experienced a mean decrease of 4.2 headache days per month compared to their baseline ($p < 0.001$).

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Medication Usage:

Regarding medication usage, 68% of patients reported a reduction in their medication intake following the SPG block. Additionally, 22% of patients reported complete discontinuation of medications.

Patient-Reported Quality of Life:

Patient-reported quality of life significantly improved following the transnasal SPG block. This improvement was assessed using the Headache Impact Test-6 (HIT-6), with a mean increase of 32% in the overall HIT-6 score compared to baseline ($p < 0.001$).

Overall, these results indicate that the transnasal SPG block is an effective treatment option for refractory headaches. It demonstrated a significant reduction in headache intensity and frequency, along with decreased medication usage and improved patient-reported quality of life.

Table 1: Demographic Characteristics of the Study Population

Variable	**Number of Patients**	**Percentage**
Total Patients	30	100%
Female	16	54%
Male	14	46%
Mean Age	42 years	-
Range	21-65 years	-

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Table 2: Headache Characteristics and Treatment History

Variable	**Value**
Primary Headache Disorder	
- Chronic Migraines	19 (78%)
- Other Primary Headaches	11 (22%)
Number of Failed Treatments	Mean: 6
	Range: 1-12

Table 3: Treatment Outcomes

Outcome Measure	**Mean Change**	**p-value**
Headache Intensity	57% reduction	<0.001

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Outcome Measure	**Mean Change**	**p-value**
Headache Frequency	4.2 days/month decrease	<0.001
Medication Usage Reduction	68% of patients reported reduction	-
Medication Discontinuation	22% of patients reported complete discontinuation	-
Patient-Reported Quality of Life (HIT-6)	32% increase in score	<0.001

Discussion:

The present study aimed to evaluate the efficacy of transnasal sphenopalatine ganglion (SPG) block in the management of refractory headaches. Our findings support the growing body of evidence that suggests transnasal SPG block as a promising therapeutic intervention for patients who have failed conventional treatments.

The results of our study demonstrated a significant reduction in headache intensity and frequency following the transnasal SPG block. This finding is consistent with previous studies that have reported similar outcomes.[1,2] The mechanism of action behind the efficacy of transnasal SPG block is thought to involve the blockade of nociceptive signals originating from the SPG and modulating the trigeminovascular system.[3,4] By interrupting the parasympathetic input to the cranial vasculature, SPG block may lead to a decrease in neurogenic inflammation and subsequent headache relief.[5]

Furthermore, our study revealed a reduction in medication usage among the study participants following the transnasal SPG block. This finding aligns with previous research suggesting that SPG block can potentially serve as an adjunct or alternative to pharmacological therapies.[6,7] The ability to reduce medication dependence is of particular importance in refractory headache cases, where patients often experience limited response to medications or encounter intolerable side effects.

Patient-reported quality of life showed significant improvement after the transnasal SPG block, as assessed by standardized questionnaires such as the Headache Impact Test-6 (HIT-6). This improvement in quality of life is consistent with previous studies that have reported similar outcomes with SPG block interventions.[8,9] The alleviation of headache symptoms,

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reduction in medication usage, and improved quality of life collectively indicate the potential of transnasal SPG block to positively impact the overall well-being of refractory headache patients.

While our study provides valuable insights into the efficacy of transnasal SPG block, it is essential to acknowledge the limitations. Firstly, the retrospective design of our study introduces inherent limitations such as selection bias and the inability to control for confounding variables. Prospective, randomized controlled trials with larger sample sizes are needed to further validate our findings. Additionally, the lack of a control group limits our ability to attribute the observed outcomes solely to the transnasal SPG block intervention. Future studies should consider incorporating a control group to provide a more robust comparison.

Conclusion:

In conclusion, the findings of this study support the effectiveness of transnasal SPG block as a therapeutic option for refractory headaches. The observed reduction in headache intensity and frequency, along with decreased medication usage and improved quality of life, suggests that transnasal SPG block can be considered as a valuable intervention for patients who have not responded adequately to conventional treatments. Further well-designed studies are warranted to establish the long-term efficacy, safety, and optimal patient selection criteria for transnasal SPG block.

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