ORIGINAL STUDY ARTICLE

DOI: https://doi.org/10.17816/fopr643496 EDN: WDMZJU

Treatment Strategy for Patients With Vasomotor Rhinitis Following Laser Coagulation of Nasal Turbinates

Marina A. Ryabova, Mikhail Yu. Ulupov, Jakhongir O. Rakhmonov

Academician I.P. Pavlov First St. Petersburg State Medical University, Saint Petersburg, Russia

ABSTRACT

BACKGROUND: *Laser coagulation of the nasal turbinates* is a widely used procedure in the treatment of *vasomotor rhinitis*, with various wavelengths and techniques being employed. However, scientific sources on this subject rarely emphasizes postoperative nasal mucosa care. Authors either use various medications or limit postoperative care to nasal irrigation with saline solution. To date, no studies have been conducted comparing the effectiveness of different postoperative management methods following laser coagulation of the nasal turbinates.

AIM: The work aimed to conduct a comparative assessment of the effectiveness of two intranasal therapy regimens in the early postoperative period following laser coagulation of the inferior nasal turbinates.

METHODS: *Superficial laser treatment* was performed on the inferior nasal turbinates in 57 patients diagnosed with vasomotor rhinitis, using a 1.94 μm wavelength laser at 4 W power. During the seven-day postoperative period, patients were divided into two groups: Group 1 received irrigation therapy with isotonic saline, and Group 2 used a phenylephrine + cetirizine nasal spray. Symptom severity was assessed using the *NOSE scale* on postoperative day 1, day 7, and one month after surgery to evaluate symptom changes in two groups. Nasal endoscopy was also performed at the same time points.

RESULTS: On postoperative day 1, a 10-point worsening on the NOSE scale due to nasal obstruction was recorded in Group 1 (isotonic saline irrigation), whereas no deterioration on the NOSE scale was noted in Group 2 (phenylephrine + cetirizine spray). By day 7, the difference between the groups remained 10 points, reflecting a moderate level of dissatisfaction. After one month, when postoperative conservative therapy was discontinued, no significant differences between the groups were found, and all patients reported satisfactory nasal breathing.

CONCLUSION: Local irrigation therapy, as well as phenylephrine combined with cetirizine in spray form, is justified during the postoperative period following laser coagulation of the inferior nasal turbinates.

Keywords: vasomotor rhinitis; superficial laser coagulation; 1.94 μm wavelength; NOSE scale.

To cite this article

Ryabova MA, Ulupov MYu, Rakhmonov JO. Treatment Strategy for Patients With Vasomotor Rhinitis Following Laser Coagulation of Nasal Turbinates. *Folia Otorhinolaryngologiae et Pathologiae Respiratoriae.* 2024;30(4):270–276. DOI: 10.17816/fopr643496 EDN: WDMZJU

Submitted: 13.01.2025 **Accepted:** 01.02.2025 **Published online:** 28.02.2025

ОРИГИНАЛЬНОЕ ИССЛЕДОВАНИЕ

DOI: https://doi.org/10.17816/fopr643496 EDN: WDMZJU

Выбор метода лечения больных вазомоторным ринитом после лазерной коагуляции носовых раковин

М.А. Рябова, М.Ю. Улупов, Ж.О. Рахмонов

Первый Санкт-Петербургский государственный медицинский университет им. акад. И.П. Павлова, Санкт-Петербург, Россия

АННОТАЦИЯ

Обоснование. В настоящее время лазерная коагуляция носовых раковин при вазомоторном рините — распространенная процедура, где применены различные длины волн и методики. В научной литературе, посвященной этой теме, обычно, не делают акцент на послеоперационном уходе за слизистой оболочкой полости носа, авторы применяют различные медикаменты или ограничиваются орошениями полости носа солевым раствором. Исследований, посвященных сравнению эффективности того или иного метода послеоперационного ведения пациентов после лазерной коагуляции носовых раковин, не проводили.

Цель — провести сравнительную оценку эффективности двух вариантов интраназальной терапии в раннем периоде после лазерной коагуляции нижних носовых раковин.

Материалы и методы. Было осуществлено поверхностное лазерное воздействие на длине волны 1,94 мкм при мощности 4 Вт на нижние носовые раковины 57 пациентам с диагнозом «вазомоторный ринит». В послеоперационном периоде в течение семи дней в первой группе пациенты использовали ирригационную терапию изотоническим солевым раствором, во второй группе применяли фенилэфрин + цетиризин в форме спрея. Тяжесть симптомов оценивали по шкале NOSE: через день после операции, через семь дней и через 1 мес., что позволило выявить динамику симптомов в двух группах. Была также проведена эндоскопия полости носа в эти же сроки.

Результаты. У пациентов, получавших ирригационную терапию с изотоническим солевым раствором, по шкале NOSE было отмечено ухудшение на 10 баллов из-за заложенности носа в первые сутки после операции, в то время как у пациентов, получающих дополнительно спрей фенилэфрина с цетиризином (вторая группа), по шкале NOSE ухудшений не отмечено. На седьмые сутки разница между группами составила 10 баллов — умеренная степень неудовлетворенности. Через месяц, когда пациенты перестали использовать консервативную терапию после операции, значимых различий между группами выявлено не было, и все пациенты отмечали удовлетворительное носовое дыхание.

Заключение. Применение местной ирригационной терапии, а также фенилэфрина с цетиризином в виде спрея оправдано в послеоперационном периоде после лазерной коагуляции нижних носовых раковин.

Ключевые слова: вазомоторный ринит; поверхностная лазерная коагуляция; длина волны 1,94 мкм; шкала NOSE.

Как цитировать

Рябова М.А., Улупов М.Ю., Рахмонов Ж.О. Выбор метода лечения больных вазомоторным ринитом после лазерной коагуляции носовых раковин // Folia Otorhinolaryngologiae et Pathologiae Respiratoriae. 2024. Т. 30. № 4. С. 270–276. DOI: 10.17816/fopr643496 EDN: WDMZJU

Рукопись получена: 13.01.2025 **Рукопись одобрена:** 01.02.2025 **Опубликована online:** 28.02.2025

BACKGROUND

Vasomotor rhinitis is widely considered the primary cause of nonallergic rhinitis. This means that vasomotor rhinitis is the primary type of rhinitis that is not caused by an allergic reaction [1]. The term *vasomotor* means that this disease involves the reactivity of the cavernous vessels around the inferior nasal turbinates in response to various irritants, leading to clinical symptoms such as rhinorrhea and nasal congestion. There are currently many treatment options for vasomotor rhinitis that can relieve symptoms and improve quality of life, including lifestyle changes, nasal corticosteroids, and antihistamines [2]. However, surgery may be required to achieve complete symptom control. All surgical options involve reducing the volume of cavernous tissue in the inferior nasal turbinate using different techniques such as radiofrequency ablation, submucous resection of the turbinate, and laser coagulation [3]. All these techniques aim to eliminate nasal congestion and improve air circulation. Outpatient surgical procedures have become increasingly popular in recent years, mostly because of the development of laser surgery. Proper postoperative care of the nasal mucosa is essential to prevent complications, improve quality of life, and achieve prompt treatment outcomes. Several non-surgical postoperative treatment options are described, including nasal irrigation solutions, corticosteroid nasal sprays, antihistamines, moisturizing drops or sprays, analgesics, and systemic antibiotics [4]. However, no studies have compared the effectiveness of these options.

Reactive inflammation with hypersecretion is the primary postoperative complication, so the combination therapy can significantly improve symptoms and speed up the recovery process. Phenylephrine + cetirizine is a combined intranasal spray. Cetirizine blocks H1-histamine receptors, thereby reducing allergic reactions, cell migration, and capillary permeability. The intranasal use of cetirizine quickly reduces nasal swelling. Studies showed that the intranasal use of cetirizine and azelastine is no less effective than the oral use [6, 7], although the study population was small. Phenylephrine reduces nasal swelling and tissue infiltration by constricting blood vessels. Unlike most decongestants, it does not reduce blood flow to the mucous membrane, and it rarely causes tachyphylaxis or rebound syndrome. Phenylephrine does not affect the β-receptors in the heart, thus excluding the possibility of cardiotoxicity [8]. A 2023 study found that the combination of phenylephrine and cetirizine effectively improved symptoms of rhinitis medicamentosa and reduced the need for vasoconstrictor spray. This spray optimizes the distribution of active ingredients and moisturizes the mucous membrane due to the presence of glycerol [10].

The study aimed to compare the effectiveness of two intranasal therapy regimens during the early postoperative period after laser coagulation of the inferior nasal turbinates.

METHODS

From October 2023 to October 2024, the Otolaryngology Clinic at the First Pavlov State Medical University of St. Petersburg performed superficial laser treatment on the inferior nasal turbinates in 57 patients with vasomotor rhinitis. The treatment used a wavelength of 1.94 μm and a power of 4 W.

The inclusion criteria were as follows: symptoms of vasomotor rhinitis, including nasal obstruction and rhinorrhea, for at least 6 months; failure of non-surgical treatment (nasal corticosteroids and saline irrigation) for at least 8 weeks; vascular reserve in the nasal turbinates (the ability to decrease in volume after anemia); age 18 years or older.

The exclusion criteria were as follows: an acute condition within two weeks before or at the time of surgery; pregnancy; menstruation; other forms of rhinitis; a severely deviated septum that requires surgical treatment; nasal septum perforation; or a decompensated chronic medical condition.

The patients were randomized into two groups. Group 1 included 27 patients: 11 men (41%) and 16 women (59%). The mean age was 45 years, with a standard deviation of 17.4 years. Group 1 received postoperative irrigation treatment with two puffs of an isotonic saline spray three times a day for 7 days.

Group 2 included 30 patients: 13 men (43.3%) and 17 women (56.6%). The mean age was 35 years with a standard deviation of 7.2 years. This group received a combination of local phenylephrine and cetirizine, as well as local irrigation therapy with an isotonic saline spray, in the early stages. The treatment plan involved two doses three times a day for 7 days.

The severity of nasal congestion symptoms, which may significantly affect quality of life, was evaluated using the Nasal Obstruction Symptom Evaluation (NOSE) score at three time points: day 1, day 7, and month 1 after surgery. This approach yielded data on symptom changes after surgery for two groups.

The quantitative parameters were not normally distributed and were described using the median *(Me)* and the lower and upper quartiles [Q_1; Q_3]. The Mann-Whitney *U* test was used to compare quantitative parameters with non-normal distribution in two groups. The values were considered statistically significant at $p < 0.05$. GraphPad Prism® was used for the statistical analysis. NOSE scores were evaluated at day 1, day 7, and month 1 after surgery. Nasal endoscopy was also performed at these time points.

DOI: https://doi.org/10.17816/fopr643496

RESULTS

All patients started the prescribed treatment at day 1 after surgery. The study showed that patients who received irrigation therapy with isotonic saline had a 10-point decrease in the NOSE score, primarily due to nasal congestion at day 1 after surgery. In contrast, patients in group 2, who received a combination of phenylephrine and cetirizine, did not show any decrease in the NOSE score (Table 1). On day 7 after non-surgical treatment, the groups showed a 10-point difference in the NOSE score. Group 1 had a mean score of 37 and group 2 had a mean score of 27, which corresponds to moderate dissatisfaction (Table 2). No significant differences were found between the groups

Table 1. Subjective assessment of nasal obstruction using the NOSE scale on postoperative day 1 in both groups
Таблица 1. Анализ субъективной оценки заложенности носа по шкале NOSE через сутки после операции в двух группах

Group	NOSE score at day 1 after surgery			*p**
	Me	Q_1; Q_3	*n*	
Group 1	75	65; 95	30	0.025
Group 2	65	60; 72.5	27	

Note: * Mann–Whitney *U* test was used (also applicable to subsequent tables).
Примечание. * Используемый метод: *U*-критерий Манна–Уитни (и далее в таблицах).

Table 2. Subjective assessment of nasal obstruction using the NOSE scale one week after surgery in both groups
Таблица 2. Анализ субъективной оценки заложенности носа по шкале NOSE через неделю после операции в двух группах

Group	NOSE score at day 7 after surgery			*p**
	Me	Q_1; Q_3	*n*	
Group 1	37	27.5; 43.75	30	0.008
Group 2	27	15; 35	27	

Table 3. Subjective assessment of nasal obstruction using the NOSE scale one month after surgery in both groups
Таблица 3. Анализ субъективной оценки заложенности носа по шкале NOSE через месяц после операции в двух группах

Group	NOSE score at month 1 after surgery			*p**
	Me	Q_1; Q_3	*n*	
Group 1	15	10; 20	30	0.661
Group 2	14	10; 20	27	

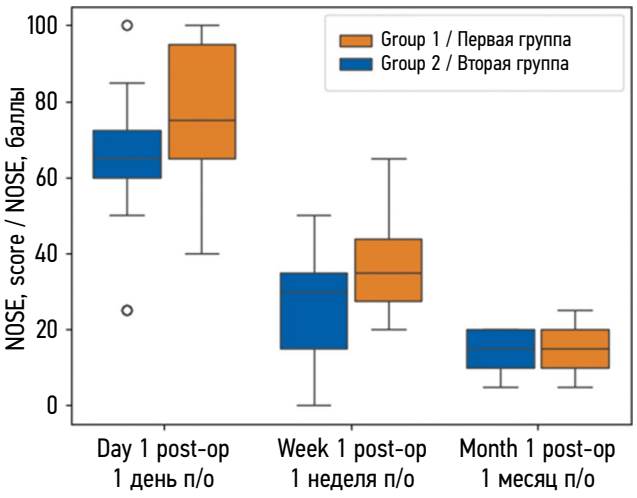

Fig. 1. Comparison of NOSE scale scores between study groups over one month postoperatively (post-op).
Рис. 1. Сравнение показателей по шкале NOSE между исследуемыми группами в течение месяца после операции (п/о).

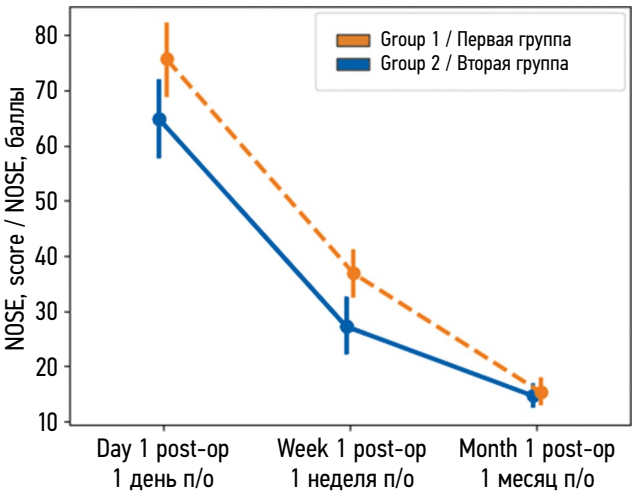

Fig. 2. Trends of NOSE scale scores during the postoperative period (post-op).
Рис. 2. Динамика показателей по шкале NOSE в послеоперационном периоде (п/о).

at month 1 after surgery, when non-surgical treatment was discontinued (Table 3).

The severity of postoperative reactive events was assessed using an endoscope. Hyperemia of the nasal turbinates and severe edema were observed in both groups on day 1, with group 1 showing more severe edema. By day 7, both groups had single crusts, fibrin partially covered the inferior turbinate, but no edema or hyperemia were observed. No epistaxis was reported in patients.

Patients who used topical saline sprays had significantly more severe nasal congestion compared to group 2. However, by week 2, both groups showed favorable results (Figs. 1 and 2).

DISCUSSION

Symptomatic treatment can improve symptoms and quality of life in patients after endoscopic endonasal surgery. Local irrigation sprays, including isotonic saline and the phenylephrine + cetirizine combination, are one of the treatment options that provide postoperative benefits, which have a favorable safety profile, are well tolerated, and are effective [12, 13].

Laser coagulation of the nasal turbinates does not cause serious complications and has a low risk of bleeding. Although postoperative management without nasal packing significantly improves patient well-being, it alters the treatment strategy during the early postoperative period.

Some patients may have panic attacks due to severe nasal congestion during the early postoperative period. In such cases, patients often self-administer vasoconstrictors, which can result in excessive mucosal dryness and a reliance on these agents. The risk of drug habituation or a rhinitis medicamentosa is low because phenylephrine and cetirizine only affect alpha-1 receptors.

This study showed that patients who used a combination of phenylephrine and cetirizine after laser coagulation of the nasal turbinates reported a significant decrease in nasal congestion and subjective discomfort. No mucosal dryness or epistaxis was observed after surgery.

CONCLUSION

The use of local irrigation therapy and a phenylephrine + cetirizine spray is recommended after laser coagulation of the inferior nasal turbinates. The combined use of these two treatment options will significantly improve breathing during the postoperative period without causing drug habituation.

ADDITIONAL INFORMATION

Acknowledgments: The authors express their gratitude to the staff of the Otorhinolaryngology Clinic at Academician Pavlov First St. Petersburg State Medical University for providing the study materials.

Author contributions: All authors made substantial contributions to the study conception, its execution, and manuscript preparation, and have read and approved the final version prior to publication.

Individual contributions: *M.A. Ryabova:* critical content review, writing—review & editing, final revisions, approval of the manuscript for publication; *M.Yu. Ulupov:* data analysis, conceptualization, writing—review & editing; *J.O. Rakhmonov:* data collection and processing, statistical analysis, data analysis, conceptualization, study design, writing—original draft.

Funding sources: The authors declare no external funding for this research.

Disclosure of interests: The authors declare no explicit or potential conflicts of interests associated with the publication of this article.

Ethics approval: The study was approved by the Local Ethics Committee of the Academician I.P. Pavlov First St. Petersburg State Medical University, Ministry of Health of the Russian Federation (Protocol No. 277 dated October 23, 2023).

Consent for publication: The authors obtained written informed consent from the patients for the publication of medical data.

ДОПОЛНИТЕЛЬНАЯ ИНФОРМАЦИЯ

Благодарности. Авторы выражают благодарность сотрудникам клиники оториноларингологии Первого Санкт-Петербургского государственного медицинского университета им. акад. И.П. Павлова за предоставленные материалы.

Вклад авторов. Все авторы внесли существенный вклад в разработку концепции, проведение исследования и подготовку статьи, прочли и одобрили финальную версию перед публикацией.

Личный вклад авторов: *М.А. Рябова* — проверка критически важного содержания, редактирование, внесение окончательной правки, утверждение рукописи для публикации; *М.Ю. Улупов* — анализ полученных данных, концепция исследования, внесение окончательной правки; *Ж.О. Рахмонов* — сбор и обработка материала, статистическая обработка материалов, анализ полученных данных, концепция и дизайн исследования, написание текста.

Источник финансирования. Авторы заявляют об отсутствии внешнего финансирования при проведении исследования.

Конфликт интересов. Авторы декларируют отсутствие явных и потенциальных конфликтов интересов, связанных с публикацией настоящей статьи.

Этический комитет. Исследование одобрено локальным этическим комитетом ПСПбГМУ им. акад. И.П. Павлова Минздрава России (протокол № 277 от 23.10.2023).

Информированное согласие на публикацию. Авторы получили письменное согласие пациентов на публикацию медицинских данных.

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AUTHORS INFO

Marina A. Ryabova, MD, Dr. Sci. (Medicine);
ORCID: 0000-0002-6714-9454;
eLibrary SPIN: 3951-7190;
e-mail: marinaryabova@mail.ru

Mikhail Yu. Ulupov, MD, Cand. Sci. (Medicine);
ORCID: 0000-0002-8460-9889;
eLibrary SPIN: 1851-8202;
e-mail: mike.ulupov@gmail.com

*** Jakhongir O. Rakhmonov**;
address: 6/8 Lva Tolstogo St., Saint Petersburg, 197022, Russia;
ORCID: 0009-0005-9176-0156;
eLibrary SPIN: 4958-4311;
e-mail: janik.27@mail.ru

ОБ АВТОРАХ

Рябова Марина Андреевна, д-р мед. наук;
ORCID: 0000-0002-6714-9454;
eLibrary SPIN: 3951-7190;
e-mail: marinaryabova@mail.ru

Улупов Михаил Юрьевич, канд. мед. наук;
ORCID: 0000-0002-8460-9889;
eLibrary SPIN: 1851-8202;
e-mail: mike.ulupov@gmail.com

*** Рахмонов Жахонгир Одил**;
адрес: Россия, 197022, Санкт-Петербург, ул. Льва Толстого, д. 6–8;
ORCID: 0009-0005-9176-0156;
eLibrary SPIN: 4958-4311;
e-mail: janik.27@mail.ru

* Corresponding author / Автор, ответственный за переписку