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The efficacy of xylometazoline, the risk of rhinitis medicamentosa (RM), and treatment strategies: A review of published studies

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ABSTRACT

Rhinitis medicamentosa is a chronic condition of the nasal mucosa caused by the overuse of decongestants containing α-mimetic drugs such as xylometazoline or oxymetazoline. This paper focuses on the definition, pathomechanism, and risk factors for RM, based on a review of scientific literature available in medical databases (PubMed/Medline/NIH), which includes results from clinical trials, meta-analyses, and cohort studies on this topic. The pharmacological mechanism of action of α-mimetic drugs and their effect on α-adrenergic receptors, as well as their significance in the development of RM, are discussed. The efficacy of xylometazoline compared to ectoine in the treatment of viral sinusitis, as well as fixed-dose combinations of xylometazoline and nasal steroids in patients with allergic rhinitis, is analyzed. The section devoted to treatment discusses the use of conservative methods (reduction of decongestant dose, discontinuation of medication, or substitution therapy) and invasive interventions (reduction of the inferior turbinates, septoplasty, radioablation). In addition, the review addresses a potential link between RM and a predisposition to psychotropic substance dependence and unipolar affective disorder. The entire review emphasizes the necessity of an individualized approach to the RM treatment process and the need for further research into alternative treatment methods to maximize patients' quality of life.

Keywords: rhinitis medicamentosa; xylometazoline; α-agonists; substance abuse

1. INTRODUCTION

Xylometazoline hydrochloride is a chemical compound that belongs to the imidazoline derivative family. When administered intranasally, it acts as a decongestant to the nasal mucosa. The drug has been used frequently as an OTC preparation for over half a century to reduce the symptoms of nasal congestion caused, among other things, by inflammation of the nasal cavity and paranasal

sinuses (Graf et al., 2018). It acts by causing a strong contraction of the blood vessels in the nasal mucosa through direct stimulation of α-adrenergic receptors, which leads to a reduction in swelling of the surrounding tissues due to decreased blood flow in the mucosa. The vascular system of the mucous membrane contains small resistance arterioles, whose contractile activity is regulated mainly by $\alpha 2$ receptors, and venous plexuses, whose diameter depends on the state of excitation of both $\alpha 2$ and $\alpha 1$ receptors. Stimulation of these receptors with α-agonists results in the relief of nasal congestion, mainly through the constriction of the venous sinuses (Wahid & Shermetaro, 2023).

The primary indication for this drug is short-term treatment of symptomatic nasal congestion, which may occur in conditions such as upper respiratory tract infections, allergic rhinitis, and sinusitis. Xylometazoline and other imidazoline derivatives are efficient in nasal congestion treatment; however, if the use of these drugs exceeds 7-10 days, there is a risk of the development of RM. RM, among other things, is caused by a growth in mucosal congestion "rebound" due to increased activity of β-adrenergic receptors or "upregulation" of α-adrenergic receptors. Patients may experience symptoms such as burning, atrophy, and dryness of the mucous membrane. After prolonged use of topical decongestants, patients may increase the frequency of use or dose to achieve the desired effect of nasal decongestion.

A complication of such an approach is drug dependence and a "vicious circle" (Margulis et al., 2024). This contributes to the need for cautious use of xylometazoline for a short period (the recommended duration of use for maximum reduction of adverse symptoms is 3 days ~ International Consensus Statement on Allergy and Rhinology 2020; 5 days ~ Brazilian Consensus on Rhinitis 2024), while RM symptoms can be treated with other topical preparations - nasal steroids or saline rinses (Wise et al., 2018).

2. REVIEW METHODS

A review of selected articles available in databases such as PubMed, NIH, and Medline was conducted. The keywords used to find relevant articles were "rhinitis medicamentosa," "xylometazoline," and "α-agonists". Inclusion criteria included case reports, randomized clinical trials, prospective and retrospective observational studies, and meta-analyses published in English between January 2016 and April 2025. The selection of articles took into consideration aspects such as the use of xylometazoline and other imidazole derivatives, the pathomechanism of rhinitis medicamentosa, its treatment modalities, and the potential association of RM with addiction. The article screening process followed the PRISMA guidelines (Figure 1).

3. RESULTS AND DISCUSSION

Use and effectiveness of nasal decongestants

A clinical trial evaluated the efficacy of 0.1% xylometazoline in relieving symptoms after septoplasty. This research was conducted as a randomized, triple-blind study. One hundred twenty patients between the ages of 15 and 60 who had undergone septoplasty for symptomatic curvature of the nasal septum were eligible. Finally, researchers analyzed the data of 106 patients who were randomly divided into two groups: group 1 received 0.1% xylometazoline, and group 2 received 0.9% saline.

Researchers administered the medication twice daily for seven days, and observed patients on the third and seventh days following the surgical intervention. On day 3, patients using 0.9% saline reported the following symptoms: bleeding (54.7%), nasal congestion (45.3%), and headache (30.2%), while the frequency of these symptoms reported by patients using xylometazoline was significantly lower, at 7.5%, 3.8% and 1.9%, respectively. Endoscopic examination of the xylometazoline group revealed substantially less swelling, scabs, and unhealed scars. On day 7, considerably more complications, such as nosebleeds, were observed in the control group, while the group using xylometazoline remained asymptomatic, and the nasal mucosa appeared normal in the endoscopic examination.

In either group, significant side effects did not occur; however, patient satisfaction was significantly higher in the xylometazoline group ($p < 0.001$). This study reveals that xylometazoline, as a safe and effective medication, can be used for postoperative treatment following septoplasty (Dawood et al., 2024). The goal of another observational study was to evaluate the efficacy and safety of different therapeutic options in treating acute viral sinusitis. The study involved 168 patients aged 7-84, divided into three equal groups: group 1 received intranasal ectoin spray, group 2 received 0.1% xylometazoline, and group 3 received both of the aforementioned drugs in combination therapy. The treatment duration was 7 days.

The study evaluated changes in the severity of symptoms (on a scale of 0-4) such as nasal congestion, discharge, headache or facial pain, and taste or smell disorders. Each group showed a statistically significant improvement ($p < 0.0001$), and symptom reduction was similar across treatments: 64.25% for ectoine, 67.60% for xylometazoline, and 70.12% for the combination. Observations revealed that monotherapy with xylometazoline caused an increase in nasal mucosal dryness, when the use of ectoine in both monotherapy and

combination therapy significantly reduced this symptom ($p = 0.034$; $p = 0.047$, respectively). Endoscopic examination showed substantially less swelling and redness of the mucosa in the groups using ectoine. The efficacy of the therapy was subjectively rated as more effective by both physicians and patients; however, the tolerability of ectoin was significantly higher ($p < 0.0004$). Objectively, nevertheless, no difference in symptom reduction efficacy was proven in any group (Werkhäuser et al., 2022).

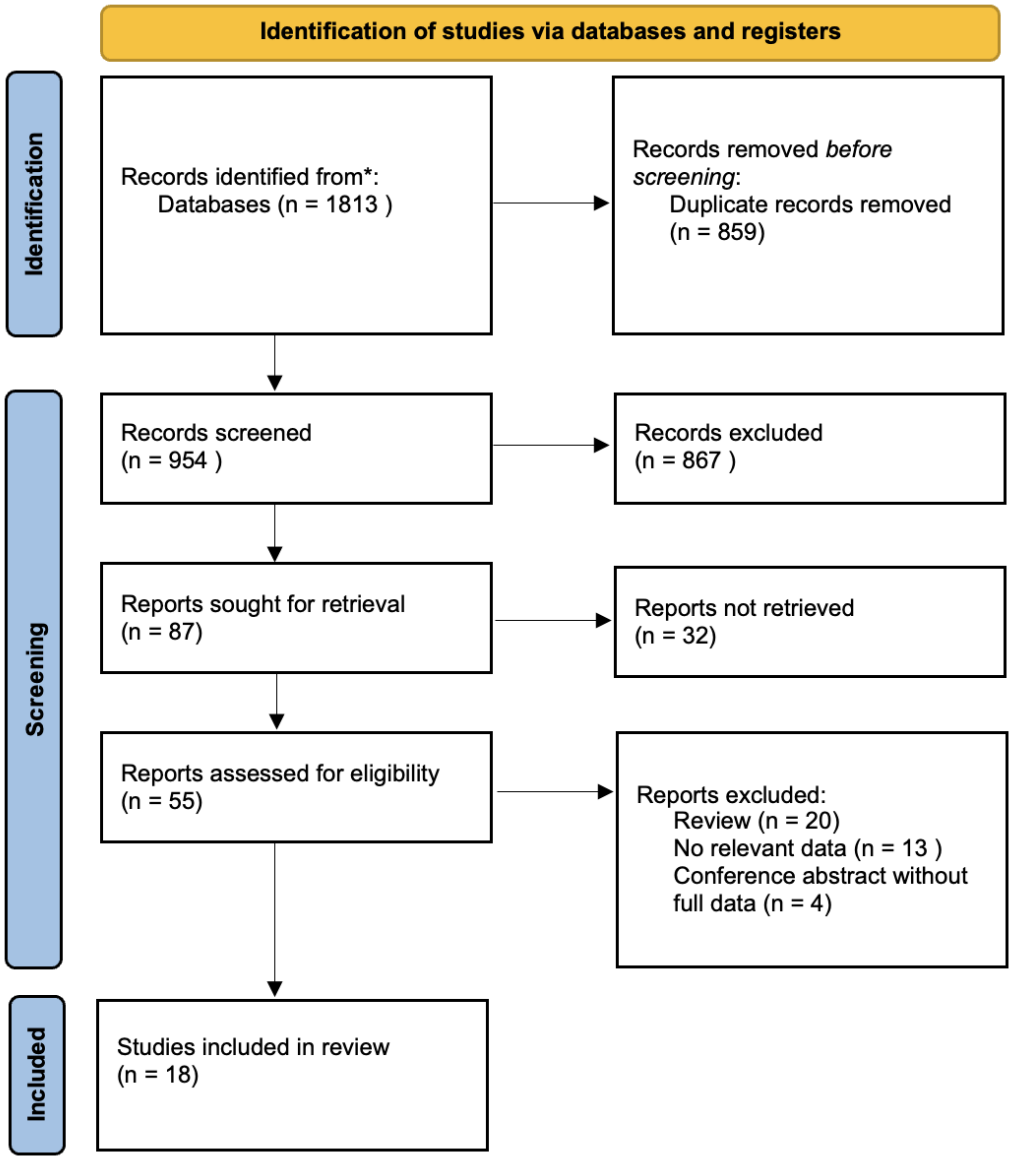

Figure 1. PRISMA flow diagram.

An observational study was conducted in a real clinical setting to evaluate the effect of 0.1% xylometazoline on the quality of life of patients with cold-induced rhinitis. The results of 102 subjects who used xylometazoline for moderate to severe nasal congestion (in addition, patients had to exhibit at least one other cold symptom) were analyzed. The duration of treatment did not exceed 7 days. The WURSS-21 questionnaire and additional questions about quality of life were used for daily assessment of the treatment's effects. Physicians observed a statistically significant improvement in all variables assessed from day 2 of treatment ($p < 0.0001$). The total WURSS-21 score decreased by 51 points, representing a 67.6% improvement, and symptoms such as nasal congestion decreased by 68.1% ($p = 0.0023$). The quality-of-life score improved by 70.4%. The use of xylometazoline spray significantly improved parameters, including sleep, energy and vitality, physical activity, and social activity by 72.5%, 76.1%, 70.7%, and 80%, respectively. Sensory perceptions, i.e., taste and smell, also improved. The average time to improvement in sleep and breathing quality was 4-5 days.

Adverse effects, including nosebleeds, headaches, and sinusitis, were reported by six participants, five of whom were considered to be treatment-related. According to the study, short-term use of xylometazoline alleviates cold symptoms and improves quality of life (Hagen et al., 2024). A randomized, multicenter, double-masked study in a population of 250 patients with allergic rhinitis (AR) and nasal congestion aimed to compare the efficacy and safety of combined intranasal therapy as a fixed-dose fluticasone furoate (27.5 μg) + oxymetazoline (50 μg) – FDC, compared to fluticasone alone in patients with allergic rhinitis. One hundred twenty-three patients received the combination product and 127 received fluticasone monotherapy.

Patients received two sprays in each nostril once daily for 28 days. The primary endpoint was the change in TNSS score assessed on days 3, 7, 14, and 28. After only 3 days of treatment, the FDC group showed a significantly greater improvement in TNSS compared to patients receiving fluticasone alone (a value of -3.1 for FDC and -2.2 for steroid monotherapy). The differences persisted until day 28, with values of -7.0 and -6.4 ($p < 0.001$). In the FDC group, the reduction in nasal congestion was significantly greater at each stage of the study, and the percentage of patients with complete resolution of this symptom was 44.7% for FDC and 26.8% for monotherapy ($p < 0.005$). A significant improvement in the total score of ocular and nasal symptoms on the TSS scale was observed. Results showed that no rebound nasal congestion occurred after discontinuation of FDC and that the therapy itself is more effective and equally safe as standard fluticasone monotherapy (Kumar et al., 2022).

The aim of a randomized, double-blind clinical trial was to investigate the efficacy and safety of combining oxymetazoline (Oxymet) with budesonide (INS) and cetirizine in patients with chronic rhinosinusitis. The study involved 50 adult patients, 16 of whom suffered from non-allergic rhinitis and 34 from allergic rhinitis. The participants were divided equally into two groups, each containing 25 patients; one group received placebo + budesonide + cetirizine, while the other received Oxymet + budesonide + cetirizine for 4 weeks, with two sprays in each nostril twice a day, after which both groups continued therapy with budesonide and cetirizine alone for another 14 days. The results revealed a statistically significant reduction in nasal congestion in the Oxymet group on days 15-28 ($p = 0.034$) and days 29-42 ($p = 0.038$). In patients with allergic rhinitis who belonged to the Oxymet group, researchers observed improvement in the first week of the study. Moreover, researchers observed a significant reduction in anosmia in the Oxymet group ($p = 0.008$). An improvement in quality of life (according to the RCQ questionnaire) was observed in both groups, although there was no statistically significant difference between them.

The results confirm that the combination of Oxymet and INS is effective in treating nasal congestion, especially in allergic rhinitis. After discontinuation of Oxymet, researchers observed no rebound effect, which validates the significant difference in symptom severity between days 1 and 42 ($p < 0.001$) (Thongngarm et al., 2016). A double-blind, randomized study aimed to evaluate the efficacy of the combination of mometasone furoate (MF) and oxymetazoline (OXY) in children with adenoid hypertrophy and chronic allergic rhinitis. The Phase I study population consisted of 240 children who were randomly assigned to receive MF or a placebo. In Phase I, the response rate in the study group was 39%, and the reduction in the adenoid/choana (A/C) ratio in these patients was 53.1% ($p < 0.05$), while the nasal cavity volume increased by an average of 4 cm^3.

Patients from the study group who did not respond to Phase I treatment qualified for Phase II, which lasted 8 weeks. Patients were assigned to four groups, receiving MF/placebo, MF (50 μg/dose)/OXY (0.05%), placebo/OXY, and placebo/placebo, respectively. In the MF/OXY group, ~70% of patients experienced a reduction in nasal congestion and tonsil hypertrophy after an average of 4 weeks of therapy ($p < 0.05$), while the A/C ratio decreased from 87.2% to 27.3% after 8 weeks. This effect persisted for an average of six months without recurrence. Allergic symptoms improved but returned to baseline levels on average 2 weeks after the end of treatment. Patients tolerated the MF/OXY combination well, and no serious adverse effects were observed. The study's results reveal that combining mometasone furoate with oxymetazoline is an efficacious and safe treatment method for children with adenoid hypertrophy coexisting with chronic rhinosinusitis, especially in those who did not respond to steroid monotherapy (Liu et al., 2017).

Rhinitis medicamentosa as a complication of decongestant abuse

In 2019, a survey was conducted among Canadian otolaryngologists, providing critical statistical data that illustrated the scale of the RM problem among patients who abuse nasal decongestants. The survey of physicians shows that although RM is not a common problem, it is a significant clinical issue, with 50.7% of physicians reporting 0 to 10 cases per year and 34.8% reporting 11 to 20 cases. All respondents confirmed that the diagnosis of RM is based on a history of chronic use of nasal decongestants. This confirms the causal relationship between the abuse of such drugs and the development of the disease.

Data on awareness of the risks associated with decongestant abuse are also significant: 79% of physicians considered that warnings about the complications of drug abuse were not sufficiently visible, and 75% believed that the content of the warnings was inadequate.

Additionally, 59% of otolaryngologists reported cases in which other physicians incorrectly recommended the use of these drugs, despite 61% of respondents believing that family doctors possess sufficient knowledge about RM.

The survey results indicate that improved education of both patients and medical personnel on the use of topical decongestants is necessary to reduce the incidence of rhinitis medicamentosa. It is also crucial that drug labeling changes be made so that patients using the product are more aware of the complications of treatment nonadherence (Fowler et al., 2019).

In 2021, a case was reported of a patient with diagnosed allergic rhinitis who presented with progressive nasal obstruction that had persisted for 2 months. The patient was allergic to allergens such as house dust mites and the proteins found in dog and cat hair. The main symptoms reported by the patient included difficulty breathing through the nose, watery rhinorrhea, postnasal drip, and itching of the palate and throat. Two months earlier, the patient had been prescribed a nasal spray containing a decongestant (without specifying the active ingredient). In an attempt to obtain relief, the patient used the product more and more frequently and in increasing doses, which exacerbated the problem.

Both physical examination and rhinoendoscopy showed scabs and hypertrophy of the inferior turbinates. A diagnosis was made - rhinitis medicamentosa. Doctors advised the patient to discontinue the decongestant immediately and implemented a combination treatment that included allergen immunotherapy, antihistamines, and INS. One day after discontinuation, secondary swelling of the inferior turbinates was observed, caused by previous overuse of the decongestant. After 3 months of conservative treatment, there was a marked improvement in nasal patency and a reduction in rhinorrhea, but the patient still reported a feeling of obstruction at night. For this reason, the patient has undergone a turbinate reduction procedure, after which he completely regained nasal patency and became asymptomatic (Li et al., 2021).

A prospective observational study in 2022 evaluated the factors predisposing to the development of CR in patients using intranasal decongestants and the factors negatively affecting attempts to discontinue their use. The study included 119 patients, of whom 68 suffered from RM and 51 had chronic rhinitis of other causes. Patients with RM most often abused naphazoline (65%) and oxymetazoline (26%). These agents were used on average 2.7 times a day, and the average duration of abuse was 31.8 months. It was shown that factors such as high anxiety (assessed using the HAM-A scale), smoking, a history of psychiatric disorders, and the presence of inflammation in nasal cytology were significantly more common in the MR group. The odds ratios (ORs) for patients suffering from these conditions were 19.26, 13.36, 8.01, and 2.61, respectively.

After 3 months of treatment, 70.6% of patients with RM discontinued decongestants, while 29.4% were either unable to discontinue them or resumed their use after some time. The most important factors negatively affecting attempts to discontinue medication were high HAM-A scores (>18) and positive nasal cytology (OR 5.29 and 3.69, respectively). Although symptoms such as nasal congestion, runny nose, and irritation improved in patients who discontinued decongestants, not all patients were able to discontinue decongestants (De Corso et al., 2020).

A study conducted in Pakistan on a group of 39 patients showed that the leading cause of MR development was the abuse of xylometazoline. 51.28% of respondents reported that they had received this drug from a doctor without appropriate recommendations regarding its duration of use, and 35.9% used the drug without prior medical consultation. The results also showed an association between dust exposure and the development of RM – 89.74% of patients reported daily contact with a dusty environment, which led to allergic rhinitis and an overuse of decongestants.

The study highlights the importance of educating patients and physicians about the responsible use of xylometazoline, as well as the need for improved control over the drug's distribution and promotion of alternative treatments (Zareen et al., 2016). A summary of this section is presented in Table 1.

Treatment of rhinitis medicamentosa

In the aforementioned study by Fowler et al., (2019) a survey revealed that Canadian otolaryngologists prefer two primary therapeutic strategies for treating RM: discontinuation of decongestants (96% of respondents) and the addition of intranasal glucocorticosteroids (INS; 94%). Sixty-one percent of the doctors surveyed used both methods simultaneously. Less popular treatments included nasal rinsing with saline (55%) and oral GCS (25%). Surgical reduction of the turbinates was considered by only 14% of otolaryngologists, mainly in cases resistant to conservative treatment. The results of the study show that physicians rely on similar treatment regimens involving drug withdrawal and local anti-inflammatory treatment, even though other therapeutic options are available. As there is no standardized treatment regimen for RM, further research is required to establish optimal treatment guidelines.

Table 1. Summary of causes, risk factors, and prevalence of rhinitis medicamentosa.

Investigators	Study Design	Participants	Main Findings
(Fowler et al., 2019)	Survey	69 Canadian otolaryngologists	Chronic rhinitis is not a common disease, but it is clinically important: 50.7% of physicians reported 0-10 cases per year, and 34.8% reported 11-20 cases. All respondents diagnosed chronic rhinitis based on their patients' history of decongestant use. 79% stated that drug warnings were not visible, and 75% believed the warning labels were inadequate. 59% reported instances of incorrect recommendations by other doctors. There is a need for improved education and more transparent labeling.
(Li et al., 2021)	Case report	1 patient with allergic rhinitis	Patient with chronic nasal obstruction following overuse of a nasal decongestant diagnosed with RM. Treatment improved symptoms, but surgical turbinate reduction was ultimately necessary for complete relief and recovery.
(De Corso et al., 2020)	Prospective observational study	119 patients (68 with RM, 51 with other types of chronic rhinitis)	Average duration of decongestant overuse: 31.8 months. Risk factors for RM include high anxiety (OR 19.26), smoking (OR 13.36), psychiatric history (OR 8.01), and nasal inflammation (OR 2.61). After 3 months, 70.6% of patients discontinued the drug, while 29.4% relapsed. Positive nasal cytology and HAM-A scores over 18 reduced the chances of quitting successfully.
(Zareen et al., 2016)	Observational study	39 patients with RM	Xylometazoline abuse was the main cause of RM. 51.28% of patients received a drug prescription without clear recommendations. 35.9% used it without consulting a doctor. 89.74% had daily dust exposure (allergic rhinitis and RM development risk factors).

In another study conducted in 2024, researchers compared two treatments for RM in a retrospective analysis. The research included 47 patients, 26 of whom were to undergo surgical treatment (endoscopic turbinoplasty), and 21 were to receive conservative treatment consisting of INS, antihistamines, and saline rinses. The results showed that surgical treatment was more effective in terms of both improving quality of life and reducing the use of decongestants. After surgery, the frequency of decongestant use (0.04 uses per day) was significantly lower than in the conservative treatment group (1.49 uses per day; $p < 0.001$). In the surgically treated group, a significant increase in the quality-of-life index, as assessed by the SNOT-22 scale, was observed, with an average increase of 25.6 points ($p < 0.001$). However, in patients treated conservatively, researchers observed no significant growth (a mean of 3.5 points) (Margulis et al., 2024).

A 2025 retrospective analysis was conducted that included two groups of patients undergoing surgical correction of nasal patency. The study's goal was to assess the efficacy of surgical treatment of nasal obstruction in patients with RM compared to patients without the condition. Group 1 consisted of 36 patients with RM, and Group 2 (control) consisted of 116 patients without RM. All patients

underwent a bilateral reduction of the inferior turbinates (some patients additionally underwent septoplasty). To evaluate the changes, researchers used the NOSE scale (baseline and postoperative value). Also, the percentage of patients with RM who were able to discontinue intranasal α-mimetics after the procedure was evaluated. Patient follow-up time averaged 972 days in the RM group and 565 days in the control group. A statistically significant improvement in nasal symptoms occurred in both groups: the RM patients achieved a decrease in NOSE score of 9.8 points ($p < 0.0001$), while the control group achieved a reduction of 8.6 points ($p < 0.0001$).

The research revealed that the efficacy of the treatment is comparable regardless of the α-mimetics used previously – the difference between the groups in terms of NOSE change was not statistically significant ($p = 0.2438$). It was also shown that 86.1% of RM patients discontinued the use of decongestants at long-term follow-up after the procedure. The results show that in drug-resistant RM, surgical intervention brings clinically comparable benefits to patients without RM to improve nasal patency, while facilitating the discontinuation of α-adrenergic preparations (Di Ponio et al., 2024).

Researchers conducted a prospective cohort study to evaluate the effect of radiofrequency thermal ablation (RFATR) of the inferior turbinates in patients with hypertrophy of these structures, including patients with RM. The study involved 90 patients with inferior turbinate hypertrophy (ITH) who underwent RFATR between 2017 and 2019. The cohort was divided into patients with and without MR. The NOSE and SNOT-22 scales were used to assess the quality of life (QoL) of the patients before and after the procedure. The study's results showed that 88.9% of participants reported an improvement in their quality of life after RFATR treatment, and in the RM group, all patients ceased using nasal decongestants. In the RM group, the progress on the NOSE scale was statistically significant ($p = 0.025$), while on the SNOT-22 scale, no significant differences were observed between the RM group and the rest of the cohort ($p = 0.10$). The percentage of patients achieving a minimally clinically notable change (MCID) on the SNOT-22 scale was high in both groups, with no statistically significant difference ($p = 0.2$).

The study demonstrates that RFATR is an effective treatment for nasal obstruction in both patients with and without RM. The procedure significantly improves the patients' quality of life and enables discontinuation of intranasal decongestants, even in those who are dependent on these preparations (Neiderman et al., 2023). A summary of this section is presented in Table 2.

Table 2. Overview of treatment options for rhinitis medicamentosa.

Investigators	Study Design	Participants	Main Findings
(Fowler et al., 2019)	Survey	69 Canadian otolaryngologists	Physicians' preferred treatments included stopping decongestants (96%) and using intranasal corticosteroids (94%), with 61% using both. Less common options were saline rinses (55%), oral corticosteroids (25%), and turbinate surgery (14%).
(Margulis et al., 2024)	Retrospective analysis	47 RM patients (26 surgical, 21 conservative)	Endoscopic turbinoplasty proved more effective than conservative therapy (INS, antihistamines). Post-op decongestant use: 0.04/day compared to 1.49/day in the conservative group ($p < 0.001$). QoL (SNOT-22): +25.6 points after surgery versus +3.5 points with conservative treatment.
(Di Ponio et al., 2024)	Retrospective analysis	152 patients (36 with RM, 116 without RM)	All patients underwent inferior turbinate reduction, and a few also had septoplasty. Both groups showed improvement: the RM group had a NOSE score reduction of -9.8 ($p < 0.0001$), while the control group improved by -8.6 ($p < 0.0001$). There was no significant difference between groups ($p = 0,2438$). Additionally, 86.1% of RM patients discontinued decongestants long-term.

(Neiderman et al., 2023)	Prospective cohort study	90 patients with inferior turbinate hypertrophy (including RM patients)	RFATR improved QoL in 88.9% of patients. In the RM group, all patients who used decongestants discontinued their use of these medications. A significant improvement in the NOSE score was observed ($p = 0.025$). There was no significant difference in SNOT-22 scores between RM and non-RM groups. RFATR is effective regardless of RM status.

Decongestant addiction and other addictions

A qualitative study was conducted that examined nasal spray addiction resulting in RM. The study aimed to see if the subjects manifested signs of the six components of addiction according to the Griffiths model: tolerance, withdrawal symptoms, loss of control, prioritization of the substance, continuation despite harm, and guilt. In the study, researchers conducted semi-structured interviews with 20 patients with long-term use of xylometazoline and other derivatives of the substance. The range of decongestant use was from 2 to 40 years (average 9.6 years).

In most of the subjects, symptoms typical of behavioral addiction were noted. These included an increasing need for the spray, a compulsion to use it despite an awareness of the harm it causes, and a relapse of symptoms when trying to stop. Some patients reported that they used the drug more than a dozen times a day, far exceeding the number of doses recommended by the manufacturer, while trying to stop using decongestants; withdrawal symptoms were so uncomfortable that patients returned to using them. Patients' statements also indicated frustration and guilt, indicating the presence of behavioral addiction. The results of the study showed that although RM is not officially classified as an addiction, in many cases, it meets the psychological and behavioral criteria for a habit disorder. They also suggest that in the treatment of RM, especially chronic and resistant to conventional therapy, a psychotherapeutic component should also be considered (Lakatos et al., 2025).

In a multicenter prospective observational study, researchers assessed whether patients with RM have an increased propensity to fall into addiction or depression. Eighty-six patients diagnosed with RM were included in the study. 57% of them used xylometazoline, and 38% used oxymetazoline. The mean duration of drug use was 22.79 months (range 2-240), and the mean duration of nasal obstruction symptoms was 9.79 months (range 1-40). The Beck Depression Inventory (BDI) scale and tests identifying addictive tendencies were used to assess mental status: the Substance Abuse Proclivity Scale (SAP) and DUDIT.

The results showed that 15.7% of patients manifested symptoms suggestive of depression; however, there was no increased propensity for addiction. The study found no statistically significant correlations between depression or addiction propensity and factors such as gender, age, smoking, duration of symptoms, or length of use of intranasal decongestants ($p > 0.05$ for each variable). The results indicate that patients who abuse decongestants do not show increased susceptibility to affective disorders or psychoactive substance abuse. Nor do they require special precautions regarding the risk of psychotropic addiction (Birinci et al., 2024). A summary of this section is presented in Table 3.

Table 3. Correlation between decongestant dependence and other addictions.

Investigators	Study Design	Participants	Main Findings
(Lakatos et al., 2025)	Qualitative study	20 patients with long-term use of xylometazoline (average 9,6 years of overuse)	Most patients showed symptoms of behavioral addiction based on the Griffiths model (tolerance, withdrawal, loss of control, prioritization, continuation despite harm, and guilt). Results indicate that RM meets psychological criteria for a habit disorder and that incorporating a psychotherapeutic component should be considered in treatment.

(Brinici et al., 2024)	Prospective observational study	86 patients diagnosed with RM (57% used xylometazoline, 38% oxymetazoline)	15,7% of patients exhibited symptoms suggestive of depression; however, there was no increased likelihood of addiction. No statistically significant correlations were found between depression or addiction propensity and factors like gender, age, smoking, or duration of symptoms or use. Patients do not appear to have increased susceptibility to other addictions.

Xylometazoline and other α-mimetic substances are effective nasal decongestants and have been used in short-term postoperative treatment (Dawood et al., 2024) and the treatment of acute upper respiratory tract infections (Hagen et al., 2024). However, prolonged use of this type of medication for more than 7-10 days may result in the development of rhinitis medicamentosa caused by upregulation of α-adrenergic receptors and secondary mucosal edema. For this reason, particular caution should be exercised while using decongestants (Li et al., 2021; Wahid & Shermetaro, 2023).

The key factor in developing rhinitis medicamentosa remains the overuse of drugs containing substances like xylometazoline or oxymetazoline. This issue arises from patients lacking knowledge about potential risks and physicians failing to provide enough information, resulting in improper drug use. The occurrence of rhinitis medicamentosa is also affected by factors such as high anxiety, smoking, chronic inflammation of the nasal mucosa, and exposure to allergens and pollutants (De Corso et al., 2020; Zareen et al., 2016). The following treatment options are available for rhinitis medicamentosa:

1. Conservative treatment involves gradually stopping decongestants and using INS or saline rinses (Margulis et al., 2024; Kumar et al., 2022; Wahid & Shermetaro, 2023).
2. Surgical treatment, such as RFATR radioablation or turbinoplasty, which is effective in patients refractory to pharmacotherapy and significantly improves both nasal patency and quality of life (Di Ponio et al., 2024; Neiderman et al., 2023).

However, patient education and awareness of the risks associated with long-term use of decongestants are of paramount importance (Fowler et al., 2019). Although rhinitis medicamentosa is not classified as an addiction in itself, numerous patients exhibit characteristics typical of addictive disorders, such as loss of control over the frequency of spray use, withdrawal symptoms (increased swelling when attempting to discontinue use) and continued use despite awareness of the harm (Lakatos et al., 2025; Li et al., 2021). However, there is no confirmed link between RM and a predisposition to other addictions (Birinci et al., 2024).

4. CONCLUSION

Xylometazoline and other imidazoline derivatives remain effective in the symptomatic treatment of nasal obstruction and in improving patients' quality of life both after ENT surgery and during viral infections. However, patients' noncompliance with recommendations regarding the duration of use of these substances leads to rhinitis medicamentosa, which requires a comprehensive therapeutic approach, and sometimes surgical intervention is the only option for complete cure. This fact highlights the importance of educating both patients and physicians about the safe use of decongestants, particularly regarding the duration of their use.

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Abbreviations

RM – Rhinitis Medicamentosa
WURSS – Wisconsin Upper Respiratory Symptom Survey
HAM-A – Hamilton Anxiety Rating Scale (HAM-A)
OR – Odds Ratio
BDI – Beck Depression Inventory
DUDIT – Drug Use Disorders Identification Test
SNOT-22 – 22-item Sinonasal Outcome Test
AR – Allergic rhinitis

TNSS – Total Nasal Symptom Score
SAP – Substance Abuse Proclivity Scale
ITH - Inferior Turbinate Hypertrophy
RFATR – Radio Frequency Ablation Turbinate Reduction
QoL – Quality of Life
MF – Mometasone furoate
OXY – Oxymetazoline
INS – Intranasal Steroids
OTC – Over-the-counter drug
A/C – Adenoid/Choana ratio
MCID – Minimal Clinically Important Difference
FDC – Fixed Dose Combination

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Data and materials availability
All data associated with this work are present in the paper.

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