

Self-Medication in Persistent Rhinitis: Overuse of Decongestants in Half of the Patients

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What is already known about this topic? Rhinitis is a common reason for self-medication with over-the-counter drugs. However, this self-treating population has remained largely unstudied.

What does this article add to our knowledge? Half of individuals self-medicating persistent rhinitis overused intranasal decongestants, despite the fact that they were educated about the limit on duration of use. Use of intranasal glucocorticosteroids was strongly (but inversely) related to nasal decongestant overuse.

How does this study impact current management guidelines? This study draws attention to the problem of intranasal decongestant overuse among subjects self-medicating persistent rhinitis. Our findings also suggest that patient education alone is not effective in preventing and/or managing overuse.

BACKGROUND: Patients with rhinitis often self-medicate with over-the-counter drugs, however this self-treating population has remained largely unstudied.

OBJECTIVE: To characterize individuals self-medicating persistent rhinitis and to determine the prevalence of and risk factors for intranasal decongestant overuse within this population.

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METHODS: A cross-sectional observational study of individuals self-medicating persistent rhinitis (defined according to the Allergic Rhinitis and its Impact on Asthma guidelines).

Participants (n = 895) completed a self-administered questionnaire to assess current symptoms, rhinitis medication, and previous physician diagnosis. Intranasal decongestant overuse was defined as daily use for at least 1 year.

RESULTS: The vast majority of subjects (95%) had moderate-to-severe rhinitis. Nasal congestion was the predominant symptom (median visual analog scale, 6.6 cm; interquartile range, 3.4 cm). Sixty-five percent had had their current nasal problems for more than 5 years. Approximately 80% had a physician diagnosis (mainly allergic rhinitis or rhinosinusitis). The prevalence of intranasal decongestant overuse was high (49%), despite the fact that most of the patients (80%) were educated about the limit on duration of use. Use of intranasal glucocorticosteroids was inversely related to being an overuser (odds ratio 0.24 [95% CI, 0.17-0.35]). The risk of intranasal decongestant overuse also was reduced by use of other medications (oral H1 antihistamines and decongestants), use of nasal saline solution, and more symptoms of itchy and/or runny eyes or colored mucus. Risk was increased by a more severely blocked nose, longer duration of symptoms, the presence of sleep disturbance, higher body mass index, and previous advice to limit the duration of intranasal decongestant use.

CONCLUSION: Half of the individuals self-medicating persistent rhinitis overused intranasal decongestants, despite the fact that they were educated about the limit on duration of use. © 2014 American Academy of Allergy, Asthma & Immunology (J Allergy Clin Immunol Pract 2014;2:313-9)

Key words: Rhinitis; Self-medication; Community pharmacy

Rhinitis is a prevalent condition characterized by nasal congestion, rhinorrhea, sneezing, and/or itching. It is classified as allergic or nonallergic, but some types of rhinitis have both

Abbreviations used

ARIA- Allergic Rhinitis and its Impact on Asthma

OTC- Over-the-counter

SFAR- Score For Allergic Rhinitis

VAS- Visual analog scale

allergic and nonallergic components (eg, occupational rhinitis). Although rhinitis is sometimes regarded as a trivial disease, it may significantly affect patients' quality of life and can be associated with conditions such as sleep disturbance and headache. Also, the financial burden to society is substantial.¹ Observational studies that investigated the management of rhinitis showed that patients often self-medicate with over-the-counter (OTC) drugs.²⁻⁵ For example, in a large patient survey on intermittent allergic rhinitis in France, 44% of patients reported to self-medicate frequently.² Nevertheless, this self-treating population has remained largely unstudied.⁶ We found only 1 article that described individuals with rhinitis who had not consulted a physician in the past 2 years, with the majority of them not using medication.⁶ Thus, it is currently unclear what type of rhinitis symptoms are self-medicated, whether these symptoms were ever physician diagnosed and what type of medications are used. Furthermore, self-medication is frequently associated with risks.⁷ In the case of rhinitis, the repetitive and prolonged use of intranasal decongestants is the major concern. Long-term use of intranasal decongestants is associated with rebound nasal congestion on withdrawal, which, in turn, encourages further use that can result in hypertrophy of the nasal mucosa (rhinitis medicamentosa).^{8,9} Therefore, a short course of up to 7 days is recommended.¹⁰ Other possible adverse effects include nasal burning, irritation, and dryness.¹⁰ An article published in *The New York Times* suggests that intranasal decongestant overuse and dependence is a considerable problem in the United States.¹¹ Also, confessions of nasal spray addiction crop up regularly on Internet discussion forums (eg, a Google [Google Inc, Mountain View, Calif] search on "nasal spray addiction" results in 6,630,000 hits [search done on November 4, 2013]). However, accurate data on the magnitude of this problem are currently lacking.

In this article, we aimed to contribute to addressing the lack of knowledge about self-medication of rhinitis. We conducted a questionnaire-based survey among individuals who self-medicate persistent rhinitis to elucidate their rhinitis characteristics and drug utilization. In addition, we aimed to determine the prevalence of and risk factors for intranasal decongestant overuse within this population.

METHODS**Study design**

This cross-sectional, observational study was carried out from February until April 2012 in 181 randomly selected community pharmacies in Belgium. We chose the community pharmacy setting for this survey because, in Belgium, the sale of OTC medicines is limited to pharmacies, which means that, by recruiting in pharmacies, we sampled from the entire population of persons with self-medication intentions. Approval for the study was granted by the ethics committees of Ghent University Hospital (for Flanders) and CHU Liege (for Wallonia), and all patients gave written informed consent.

Participants

Pharmacy customers who were purchasing OTC medication for rhinitis were approached consecutively and invited to participate in the study (OTC rhinitis products available in Belgium are intranasal and oral decongestants, intranasal and oral H1 antihistamines, intranasal anticholinergics, intranasal cromones, and nasal saline solution). They were eligible when meeting the following inclusion criteria: purchasing the rhinitis medication for themselves, being age ≥ 18 years, and having persistent rhinitis (defined as symptoms during ≥ 4 d/wk and ≥ 4 consecutive weeks, according to the Allergic Rhinitis and its Impact on Asthma guidelines¹²). It was planned to recruit 6 patients from each of the pharmacies.

Data collection

Pharmacy customers who agreed to participate filled out a self-administered questionnaire developed by the multidisciplinary research team (an otorhinolaryngologist, a pneumologist, a general practitioner, a clinical pharmacologist, and pharmacists) on the basis of literature, the team's knowledge about the topic and one of our previous studies on self-medication of headache.¹³ The questionnaire was piloted, before use, by 1 community pharmacist. It collected the following information: demographics, rhinitis characteristics (onset, type and severity [assessed by using a visual analog scale, which ranged from 0, not at all bothersome, to 10 cm, extremely bothersome]), physician diagnosis of rhinitis (if available), current rhinitis medication (prescribed and nonprescribed) with frequency and duration of use ("How many days a week do you use your rhinitis medication? (a) 1 day/week or less, (b) 2-3 days/week, (c) 4-6 days/week, (d) every day"; and "How long have you been using this medication at the above mentioned frequency? (a) 6 months or less, (b) 6 months to 1 year, (c) 1 to 2 years, (d) 2 to 5 years, (e) more than 5 years"), and whether they were ever advised to limit use of intranasal decongestants. Rhinitis severity was classified as moderate or severe in those patients who reported one or more of the following: sleep disturbance; impairment of daily activities, sport, or leisure; impairment of school or work; or the presence of troublesome symptoms; and was classified as mild in those patients who reported none of these items.¹² For this study, we defined intranasal decongestant overuse as daily use of intranasal decongestants for at least 1 year (there is no standard definition of intranasal decongestant overuse available in the literature).

In addition, participants also completed the Score For Allergic Rhinitis (SFAR) questionnaire¹⁴ and an asthma screener (the questionnaire by Venables et al¹⁵).¹⁶ The SFAR is a validated screening instrument for allergic rhinitis. It questions 8 features of allergic rhinitis, which results in a total score that ranges between 0 and 16. Allergic rhinitis is suspected in patients with an SFAR score ≥ 7 .¹⁴ The asthma screener of Venables et al¹⁵ is a validated tool, which consists of 9 questions that assess the presence of asthma symptoms (cough, wheeze, chest tightness, difficulty with breathing) during the past 4 weeks. Whether asthma is suspected depends on the number of positive responses (probably no asthma, 1-2; possible asthma, 3-4; probable asthma, ≥ 5).^{15,16}

Data analysis

Descriptive statistical analysis was performed by using SPSS 20.0 (SPSS Inc, Chicago, Ill) for Windows (Microsoft Corp, Redmond, Wash). In addition, a multivariate logistic regression model was constructed to identify factors associated with being

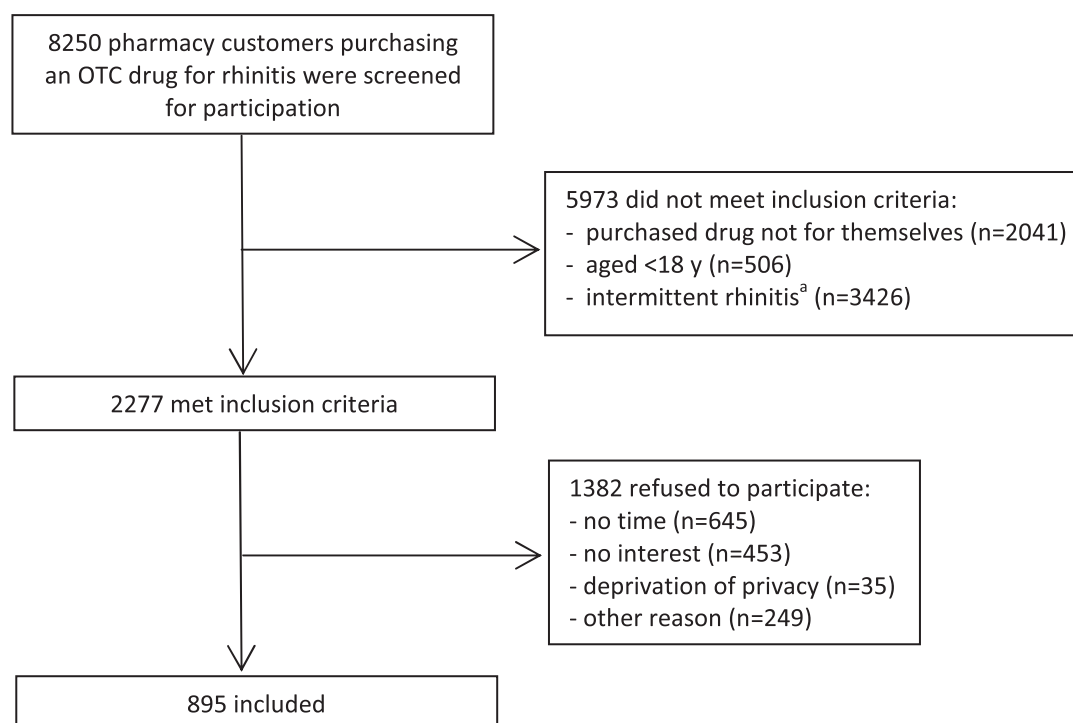


FIGURE 1. Flow scheme of the participant recruitment process. ^aSymptoms during <4 d/wk or <4 consecutive weeks (Allergic Rhinitis and its Impact on Asthma).

an intranasal decongestant overuser. The outcome variable was being an intranasal decongestant overuser (as determined by the above definition) and the testable factors were: sex, age, body mass index, smoking, symptom severity, specific impacts, visual analog scale of the types of symptoms, presence of unilateral symptoms, presence of recurrent nosebleeds, duration of symptoms, previous physician consultation and diagnosis, type of diagnosis, presence of asthma diagnosis, previous nasal surgery, current medication, and previous advice to limit the duration of use of intranasal decongestants. We used the backward elimination method and started from a full model with only the main factors. Nonsignificant factors ($P > .05$) were consecutively removed. Finally, we checked for relevant 2-way interactions of this reduced model. Based on the likelihood ratio test statistic, we identified the most important factor that explains the variation in the outcome variable.¹⁷ The analysis was performed by using R software (version 2.15.2; www.r-project.org).

RESULTS

In the 181 participating pharmacies, 8250 patients were prescreened, of whom, 2277 (27.6%) matched the inclusion criteria. Approximately 40% of patients ($n = 895$) agreed to participate (Figure 1). The basic characteristics of the study population are displayed in Table I (see section “General”).

Subject characteristics

The vast majority of participants (94.9%) had moderate-to-severe rhinitis. Nasal congestion was the predominant symptom (median visual analog scale, 6.6 cm; interquartile range, 3.4 cm). Unilateral symptoms were present in 15% of patients ($n = 137$). Seventy-two percent ($n = 641$) claimed to have perennial

symptoms, and 65% ($n = 567$) had had their current nasal problems longer than 5 years (Table I). Approximately 80% of our sample ($n = 721$) had ever consulted a physician for their current rhinitis symptoms (Table II). Seventy percent ($n = 622$) reported a physician diagnosis of rhinitis (mainly allergic rhinitis and rhinosinusitis) (Table II). Almost one-third of the subjects (190/622) proclaimed to have multiple physician diagnoses; concomitant allergic rhinitis and rhinosinusitis was the most prevalent combination (143/190). One-fifth of the participants ($n = 193$) had undergone nasal surgery. Approximately half ($n = 470$) had previously been tested for allergy (skin prick or blood test).

Fifty-five percent of the study population ($n = 491$) had allergic rhinitis according to the SFAR (ie, SFAR ≥ 7), with 148 of them (148/491 [30.1%]) not having a clinical diagnosis of allergic rhinitis. Most of these patients with “undiagnosed” allergic rhinitis had perennial symptoms (107/148). Asthma was suspected (ie, ≥ 5 positive responses with the asthma screener) in 13% of patients ($n = 117$); 67 of 117 did not have a physician diagnosis of asthma (7% of the total).

Medication use

Almost half of the patients ($n = 436$ [48.7%]) used more than 1 rhinitis medication. Sixty-four percent ($n = 573$) only used OTC medication, and 36% used OTC as well as prescription drugs. Intranasal decongestants (used by 69.6% of the study population), nasal saline solution (39.8%), intranasal glucocorticosteroids (30.3%), and oral decongestants (20.6%) were the most commonly used rhinitis products (Table III). Also, among patients with physician diagnosed allergic rhinitis or rhinosinusitis, intranasal decongestants were the most frequently

TABLE I. Subject characteristics (n = 895)

General	
Female sex, no. (%)	521 (58.2)
Age, no./total (%)	
18-25 y	99/894 (11.1)*
25-40 y	236/894 (26.4)
41-55 y	319/894 (35.7)
56-70 y	195/894 (21.8)
>70 y	45/894 (5.0)
Body mass index, no./total (%)	
<25.0 kg/m ²	458/886 (51.7)*
25.0-29.9 kg/m ²	319/886 (36.0)
≥30.0 kg/m ²	109/886 (12.3)
Current smoker, no. (%)	259 (28.9)
Rhinitis-specific	
Severity of symptoms (according to ARIA), no. (%)	
Mild	46 (5.1)
Moderate-to-severe	849 (94.9)
Impact of symptoms, no. (%)	
Sleep disturbance	649 (72.5)
Impairment of daily activities, sport, leisure	412 (46.0)
Impairment of school or work	271 (30.3)
Troublesome symptoms	797 (89.1)
Type of symptoms, median VAS (IQR) (cm)	
Blocked nose	6.6 (3.4)
Runny nose	2.8 (5.5)
Sneezing	2.6 (4.6)
Itchy nose	1.0 (4.0)
Itchy and/or runny eyes	1.8 (5.3)
Facial pain	2.9 (6.3)
Loss of smell	2.3 (5.8)
Thick, green or yellow nasal discharge	0.8 (4.0)
Postnasal drip	2.5 (5.7)
Unilateral symptoms, no. (%)	137 (15.3)
Recurrent nosebleeds, no. (%)†	70 (7.8)
Triggers (self-reported), no. (%)	
Dust	254 (28.4)
Dust mite	205 (22.9)
Tree	284 (31.7)
Grass	280 (31.3)
Animal	153 (17.1)
Aspecific	250 (27.9)
Perennial symptoms, no. (%)	641 (71.6)
Onset of symptoms, no./total (%)	
≤1 y ago	62/875 (7.1)*
2-5 y ago	246/875 (28.1)
>5 y ago	567/875 (64.8)

ARIA, Allergic Rhinitis and its Impact on Asthma; IQR, interquartile range; VAS, visual analog scale.

*Not all respondents answered each question.

†One or more times a month.

used drugs (Table III). The majority of intranasal decongestant users (500/623 [80.3%]) reported that they were advised by health care professionals to limit the duration of use to several days. Nevertheless, 70% of intranasal decongestant users (435/623) could be considered as chronic overusers (defined for this study as daily intranasal decongestant use for at least 1

TABLE II. Physician diagnosis

	No. (%)
Ever consulted physician for current rhinitis symptoms?	
Yes	721 (80.6)*
No	174 (19.4)
Physician diagnosis of rhinitis?	
Yes	622 (69.5)
No	273 (30.5)
Type of diagnosis	
Allergic rhinitis	363 (58.4†)
Nonallergic rhinitis	67 (10.8†)
Rhinosinusitis	304 (48.9†)
Other	77 (12.4†)
Patient failed to remember the diagnosis	23 (3.7†)

*The last rhinitis-related consultation was the following: <6 mo ago (243/721 [33.7%]), 6-12 mo ago (114/721 [15.8%]), 1-2 y ago (107/721 [14.8%]), and >2 y ago (214/721 [29.7%]); some patients failed to remember (43/721 [6.0%]).

†Represents the percentage of those patients with a physician diagnosis (n = 622); the total percentage exceeds 100% because some patients have multiple diagnoses.

year). This corresponds to 49% of the total study population (435/895). The results of the multivariate logistic regression model for determining factors associated with being intranasal decongestant overuser are shown in Table IV. The use of intranasal corticosteroids was the factor most strongly (but inversely) associated with overuse of intranasal decongestants (based on the likelihood ratio test statistic). The risk of intranasal decongestant overuse also was reduced by use of other medications (oral H1 antihistamines and decongestants), use of nasal saline solution, and more symptoms of itchy and/or runny eyes or colored nasal discharge (Table IV). Risk was increased by a more-severe blocked nose, a longer duration of symptoms, the presence of sleep disturbance, higher body mass index, and previous advice to limit the duration of intranasal decongestant use (Table IV).

DISCUSSION

This is the first cross-sectional observational study of individuals self-medicating persistent rhinitis (defined as symptoms during ≥4 d/wk and ≥4 consecutive weeks). We found that almost all the patients had moderate-to-severe rhinitis. Nasal obstruction was their predominant symptom. The majority of patients had a physician diagnosis of their current symptoms, and approximately half had consulted for rhinitis in the past year. However, the most striking finding of this survey was the high prevalence (49%) of intranasal decongestant overuse, despite the fact that most patients (80%) were educated about the limit on the duration of use. Multivariate analysis identified the use of intranasal corticosteroids as the factor most strongly associated with overuse, that is, use of intranasal corticosteroids decreased the odds for overusing intranasal decongestants. Intranasal corticosteroids are the first-line treatment for nasal obstruction in allergic rhinitis¹⁸ but are available by prescription only. Although most of our respondents had a physician diagnosis for their current symptoms (mainly allergic rhinitis and rhinosinusitis), only a relatively limited number were prescribed intranasal corticosteroids. Underprescribing of intranasal corticosteroids has been reported previously for allergic rhinitis^{2,19} as well as for rhinosinusitis,²⁰ and this may have led patients toward chronic

TABLE III. Rhinitis medication

	Total study population, no. (%) (n = 895)	Patients with physician diagnosis, no. (%)	
		Allergic rhinitis, n = 363	Rhinosinusitis, n = 304
Intranasal decongestants*	623 (69.6)	211 (58.1)	191 (62.8)
Mono product	551 (61.6)	188 (51.8)	166 (54.6)
Combination product†	82 (9.2)	27 (7.4)	26 (8.6)
Oral decongestants*	184 (20.6)	85 (23.4)	89 (29.3)
Mono product	7 (0.8)	1 (0.3)	3 (1.0)
Combination product‡	179 (20.0)	83 (22.9)	87 (28.6)
Glucocorticosteroids			
Intranasal	271 (30.3)	137 (37.7)	119 (39.1)
Oral	19 (2.1)	11 (3.0)	12 (3.9)
H1 antihistamines*			
Intranasal	28 (3.1)	16 (4.4)	7 (2.3)
Oral	174 (19.4)	144 (39.7)	60 (19.7)
Intranasal anticholinergics*	1 (0.1)	0 (0.0)	0 (0.0)
Intranasal cromones*	1 (0.1)	0 (0.0)	1 (0.3)
Oral antibiotics	12 (1.3)	4 (1.1)	10 (3.3)
Nasal saline solution*	356 (39.8)	163 (44.9)	161 (53.0)
Homeopathy*	118 (13.2)	69 (19.0)	52 (17.1)

*OTC available in Belgium.

†A fixed-dose combination with an anticholinergic, an H1 antihistamine, an antibiotic, or another decongestant.

‡A fixed-dose combination with paracetamol or an H1 antihistamine.

TABLE IV. Factors associated with being an overuser of intranasal decongestants (determined by multivariate logistic regression)

	Overusers, n = 435 (49% of sample)	Non-overusers, n = 460 (51% of sample)	Overusers vs non-overusers*	
			Odds ratio (95% CI)	P value
Body mass index, mean (SD) (kg/m ²)	25.7 ± 4.3	24.6 ± 4.2	1.06 (1.03-1.11)	<.01
Blocked nose, median (IQR) VAS (cm)	7.0 (3.2)	6.1 (3.3)	1.24 (1.15-1.33)†	<.001
Itchy and/or runny eyes, median (IQR) VAS (cm)	0.6 (4.2)	3.0 (6.2)	0.87 (0.83-0.92)†	<.001
Thick, green or yellow nasal discharge, median (IQR) VAS (cm)	0.5 (2.4)	1.3 (4.7)	0.88 (0.83-0.93)†	<.001
Symptom duration >5 y, %	72.8	57.2	2.28 (1.62-3.21)	<.001
Presence of sleep disturbance, %	79.8	65.9	2.13 (1.47-3.11)	<.001
Use of oral decongestants, %	13.1	27.6	0.47 (0.31-0.70)	<.001
Use of intranasal glucocorticosteroids, %	16.6	43.3	0.24 (0.17-0.35)	<.001
Use of oral H1 antihistamines, %	9.4	28.9	0.38 (0.24-0.60)	<.001
Use of nasal saline solution, %	32.0	47.3	0.61 (0.44-0.85)	<.01
Advised by health care professional to limit duration of use of intranasal decongestants, %	81.3	74.3	1.61 (1.08-2.40)	<.05

IQR, Interquartile range; VAS, visual analog scale.

*No significant 2-way interactions were observed.

†A unit is 1 cm on a 10-cm VAS.

self-medication with intranasal decongestants. It should be noted, however, that this study only looked at current medication use. It is possible that patients were prescribed intranasal corticosteroids in the past but terminated its use because of a lack of a new prescription (in Belgium, repeated prescriptions can only be obtained by consulting a physician), lack of effectiveness, or fear for adverse effects. Inadequate symptom control despite guideline compliant pharmacologic treatment has been reported for a subgroup of patients with severe chronic upper airway disease.²¹ These patients have impaired quality of life, social functioning, sleep, and school or work performance, so it is plausible that they may resort to intranasal decongestant overuse (because intranasal corticosteroids appear ineffective for

them). Fear of adverse effects could be another explanation for prematurely stopping intranasal corticosteroids. So-called steroid phobia is a well-described phenomenon for inhaled²² and transdermal corticosteroids,²³⁻²⁵ whereas, for intranasal corticosteroids, this issue has remained largely unstudied. However, a recent survey reported that 48% of patients with allergic rhinitis expressed concerns about adverse effects of intranasal steroids.²⁶

The use of oral H1 antihistamines, oral decongestants, and nasal saline solution also was found to be associated with a lower risk of intranasal decongestant overuse. Thus, it seems reasonable to suggest that patients who use any other treatment that offers some relief for nasal obstruction are less prone to overusing nasal decongestants. It should be noted, however, that long-term use

of oral decongestants (OTC available in many European countries and in the United States) is generally not recommended due to the risk for adverse effects (eg, hypertension, palpitations, insomnia).¹ Also itchy and/or runny eyes and colored nasal discharge reduced the risk of overuse, which suggests that this concerns other phenotypes of patients who experience symptoms other than nasal obstruction as the predominant symptom. Not surprisingly, more-severe nasal obstruction, longer symptom duration, and sleep impairment were related to a higher risk of nasal decongestant overuse. Congestion is associated with sleep-disordered breathing and is thought to be a key cause of sleep impairment in rhinitis, which can result in increased daytime sleepiness and decreased quality of life and productivity.²⁷ It thus seems probable that these patients search for solutions that reduce nasal congestion and the associated sleep impairment. Clearly, these patients at higher risk require extra clinical vigilance. A higher body mass index also was identified as a risk factor for overuse; however, its clinical relevance is unclear.

The majority of our respondents (80%) reported that they were ever advised by health care professionals to limit use of nasal decongestants to several days. Multivariate analysis actually indicated previous education as a risk factor for overuse; however, this is probably of no practical importance because there might be bias by the fact that the non-overuser group also included a substantial proportion of patients who did not use nasal decongestants (59%). Thus, the question about previous education was not relevant for them. When leaving this aside, the fact that most overusers were aware of the limit on duration of use suggests that patient education alone is not effective in preventing and/or managing overuse. A better understanding of patients' perspectives therefore seems critical to provide an explanation of the high rates of intranasal decongestant overuse and to inform the development of evidence-based intervention strategies to reduce overuse. Some research questions that could be addressed are as follows. Were patients prescribed intranasal corticosteroids in the past? Is a lack of effectiveness of intranasal corticosteroids or a fear of adverse effects an issue in this population? Is the fact that intranasal corticosteroids are available only by prescription a barrier? Is the direct-to-customer advertising for intranasal decongestants a potential explanatory factor?

This study has some limitations. First, we used a self-developed definition for intranasal decongestant overuse (due to the lack of a standard definition). However, the prevalence of overuse was only marginally affected by changing the threshold for overuse from "daily use for at least 1 year" (49% of the study population) to "daily use for at least 6 months" (51%), "use on at least 4 d/wk for at least 1 year" (55%), or "use on at least 4 d/wk for at least 6 months" (59%). Second, the number of potential participants who refused study participation was relatively high (approximately 60%). Potential bias caused by those who refused participation could not be assessed because our ethics committee prohibits data collection of patients who refused to enter study, but we have recorded reasons for refusal (mainly "no time" and "no interest"). Third, we used self-reported data, which may be subject to recall bias (eg, regarding physician diagnosis).

Our study design and setting aimed to minimize the risk of selection bias: (i) the community pharmacists who participated in this study were randomly selected, and each of them recruited a similar number of participants; (ii) pharmacy customers were recruited consecutively; and (iii), in Belgium, the sale of OTC medicines is limited to pharmacies, which means that

we sampled from the entire population of persons with self-medication intentions. However, the high proportion of participants with moderate-to-severe disease in this study may suggest a selection bias by severity. Therefore, clinicians should be cautious in generalizing the current findings to patients with mild rhinitis. With regard to generalizability to other countries with different health care systems, there are 2 important points that should be borne in mind. First, Belgium has a system of compulsory health insurance (organized through private, nonprofit sickness funds) that covers the entire population and with a very broad benefits package. As a result, patients' out-of-pocket costs for physician visits and medication are low. In countries with less accessible health care systems, patients may be less likely to seek medical care, and thus lower rates of physician consultation and diagnosis, patient education, and prescription medication use may be found. Second, in Belgium, OTC drugs are exclusively sold in pharmacies, whereas, in other countries, these may also be available through nonpharmacy outlets. In shops in which there is not a pharmacist present, customers need to rely on the package insert to decide whether self-medication is appropriate or not and to determine proper use of the drug. One may speculate that such customers might be more prone to nasal decongestant overuse and that prevalence rates, therefore, might be higher.

To our knowledge, this study is the first to specifically focus on self-medication of persistent rhinitis. Our findings show that intranasal decongestant overuse is prevalent among this patient population. Patient education (about the limit on duration of use) alone seems not to be effective in tackling this problem. Therefore, further in-depth research on patient perspectives seems critical to explain the high prevalence of intranasal decongestant overuse. Possible intervention strategies could include patient education in combination with smart restrictions on OTC availability of intranasal decongestants and the possibility of renewing prescriptions for intranasal corticosteroids without having to see a physician.

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