Awareness of the Saudi population regarding nasal decongestants use for allergic rhinitis and their side effects

Khalid A. Alyahya1, Zahraa A. Alsubaie1*, Zainab A. Almubarak1, Ahmed A. Al-Khalifah1, Abdullah H. Alawadh1

ABSTRACT

Background: Systemic and topical nasal decongestant drugs are widely used in otorhinolaryngology and general practice among the Saudi population. They are potent vasoconstrictive agents that are usually used in reducing congestion of nasal and ocular mucous membranes in so many diseases such as allergic rhinitis, acute rhinosinusitis, and conjunctivitis. However, long-term use of these drugs may lead to some side effects, such as rhinitis medicamentosa. This study was aimed to evaluate the awareness of the Saudi population regarding the side effects of nasal decongestant drugs.

Methodology: This is a questionnaire-based cross-sectional study including Saudi adults and excluding health care workers. The questionnaire was developed and distributed online from the period of October and November 2017. The questionnaire assessed demographical data, knowledge on allergic rhinitis, and knowledge on the side effects of decongestants and rhinitis medicamentosa.

Results: A total of 575 participants who fulfill the criteria successfully filled the questionnaires. 60.2% of those were males, 73.2% reside in cities, 89.4% were 40 years and younger, 53.0% were married, and only 30.3% had education level lower than college. 39.3% were able to identify “hereditary as the etiological factor for allergic rhinitis”. 68.5% had used nasal decongestants (66.5% had used them with a prescription and 31.5% without a prescription).

Conclusion: Nasal decongestants are considered as one of the most commonly available over the counter medications. It is advised that nasal decongestants should be only available on a prescription basis. Health workers and advocates are recommended to improve patient awareness related to nasal decongestants.

Keywords: Awareness, Saudi population, nasal decongestants, allergic rhinitis, side effects.

Introduction

Systemic and topical nasal decongestant drugs are widely used in otorhinolaryngology and general practice among the general population. Topical nasal decongestants are easily accessible over the counter drugs. Nasal decongestant drugs are alpha-adrenergic agonists such as oxymetazoline, xylometazoline, phenylephrine hydrochloride, pseudoephedrine, naphazoline hydrochloride, tetrahydrozoline hydrochloride, clomazone, tramazoline, hydroxyamphetamine, tauminoheptane, and phenylpropanolamine are sympathomimetic agents that imitate sympathetic central nervous system activity in the body [1]. They are strong vasoconstrictive agents and are commonly used in reducing nasal congestion to manage some nasal conditions such as allergic rhinitis, rhinosinusitis, allergies of the upper respiratory tract, nasal polyps, and hypertrophy [1,2]. They are rapid-acting with quick relief of symptoms. Selective adrenoceptor agonists, such as brimonidine tartrate, are also used for ocular mucosa to treat other conditions like conjunctivitis, ocular hypertension, and open-angle glaucoma [2–4]. Long-term use of nasal decongestants may induce compensatory vasodilation in the nasal arteries. The

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A total of 602 participants filled the study questionnaire. Twenty-seven participants who were not fulfill the inclusion criteria were excluded. The end sample included 575 participants who completed the questionnaire. 60.2% of those were males, 73.2% reside in cities, 89.4% were 40 years and younger, 53.0% were married, and only 30.3% had education level lower than college. Participant demographic characteristics are presented in Table 1.

Upon assessment of the etiological factors for allergic rhinitis, 39.3% were able to identify ”hereditary as the etiological factor”. Educational level was significantly

Awareness of the Saudi population regarding nasal decongestants

Subjects and Methods

This is a cross-sectional study that involves the Saudi population both female and male. It was conducted between October and November 2017. Data were collected online by a structured electronic survey. The sample was designed considering a confidence level of 95% and 5% sample errors. The sample size was 602. Adult Saudi citizens were included in this study. Non-Saudi residents, children, and health care professionals were excluded from this study. Questionnaire development was based on previously published questionnaires and was assessed by an expert to approve validity [1,12]. The assessment will be administered after obtaining consent. The population are going to answer the questions related to the use of nasal decongestants in the form of three separate sections: 1) patient’s biographical data—the social economic cultural stage will be calculated by using parameters like gender, age, education level, and residency; 2) questions related to allergic rhinitis, including etiology, triggers, and clinical features; 3) habits of nasal decongestants use, frequency of use, whether the drug is used through medical prescription, improvement of symptoms after usage, worsening after discontinuing the drug and the side effects of long-term use of drug as we aim to measure the population’s level of awareness regarding the side effects of long-term usage of nasal decongestants. The developed questionnaire was piloted to check for feasibility, time management, and acceptability of the questions and to facilitate any needed modifications before the main study. The pilot results were not included in the final data analysis.

The researchers used a multipart questionnaire to assess the awareness of participants, health behavior, biographical and socioeconomic characteristic (i.e., including age, gender, place of residence, income, smoking status, and years of formal education). Ethical approval was granted from both King Faisal University and the directorate of health before the study was conducted. Collected data were obtained through a computerized questionnaire that was accessible online and distributed through social networks. The data were recorded in Microsoft excel in 2016. Then, data were analyzed using Statistical Package for the Social Sciences version 21. Basic frequencies were used for categorical variables, and means and standard deviations were calculated for continuous variables. Chi-square testing was used to determine which factors associated with cardiovascular disease knowledge. Analysis results with a P-value of less than 0.05 were considered as significant.

Results

A total of 602 participants filled the study questionnaire. Twenty-seven participants who were not fulfill the inclusion criteria were excluded. The end sample included 575 participants who completed the questionnaire. 60.2% of those were males, 73.2% reside in cities, 89.4% were 40 years and younger, 53.0% were married, and only 30.3% had education level lower than college. Participant demographic characteristics are presented in Table 1.
Awareness of the Saudi population regarding nasal decongestants

Table 1. Demographic and clinical characteristics.

<table>
<thead>
<tr>
<th>Variables</th>
<th>Frequency (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gender</td>
<td></td>
</tr>
<tr>
<td>Male</td>
<td>374 (60.2%)</td>
</tr>
<tr>
<td>Female</td>
<td>282 (39.8%)</td>
</tr>
<tr>
<td>Residency</td>
<td></td>
</tr>
<tr>
<td>Cities</td>
<td>421 (73.2%)</td>
</tr>
<tr>
<td>Villages</td>
<td>154 (35%)</td>
</tr>
<tr>
<td>Age</td>
<td></td>
</tr>
<tr>
<td>40 years and younger</td>
<td>485 (89.4%)</td>
</tr>
<tr>
<td>41 years and older</td>
<td>90 (10.6%)</td>
</tr>
<tr>
<td>Marital status</td>
<td></td>
</tr>
<tr>
<td>Married</td>
<td>305 (53.0%)</td>
</tr>
<tr>
<td>Single</td>
<td>262 (45.6%)</td>
</tr>
<tr>
<td>Other</td>
<td>8 (1.4%)</td>
</tr>
<tr>
<td>Education</td>
<td></td>
</tr>
<tr>
<td>High school and lower</td>
<td>174 (30.3%)</td>
</tr>
<tr>
<td>College and higher</td>
<td>401 (69.7%)</td>
</tr>
</tbody>
</table>

associated ($p$-value = 0.001 < 0.05) with the identification of the etiological factor for allergic rhinitis. Figure 1 represents the most commonly chosen symptoms of allergic rhinitis.

In this study, 68.5% had used nasal decongestants and out of those, 66.5% had used them with a prescription and 31.5% had used them without a prescription (Figure 2). Although assessing the awareness of nasal decongestants adverse effects, half of the sample (54.6%) were able to identify that Nasal decongestants DO have Adverse effects, 5.6% had chosen no, 29% chose maybe, and 10.8% chose No idea (Figure 3). The level of awareness regarding the development of adverse events after 3–5 days was assessed, and it showed that 28% chose yes, 31.1% chose no, and 40.7% chose “I don’t know” (Figure 4). The method of prescription was significantly associated with Age ($p$-value < 0.05). Table 2 represents the frequency of nasal decongestants use.

In those who had used nasal decongestant, out of 447, 57.5% had noticed a significant improvement in their

Figure 1. Most commonly chosen symptoms of allergic rhinitis.

Figure 2. Comparison between using of nasal decongestants by prescription.
Awareness of the Saudi population regarding nasal decongestants

Symptoms, 36.5% had noticed a mild improvement, and 6% did not notice any improvement at all (Figure 5).

The extended use of nasal decongestants per day was significantly associated with age (>40 years) ($p$-value < 0.05). However, extended use of nasal decongestant was not significantly associated with other factors ($p$-value > 0.05), such as academic level, marital status, gender, and residency.

**Discussion**

Nasal decongest is widely available in Saudi Arabia’s prescription. Nasal decongest can be taken as “Over the counter” easily. According to this study, 31.5% had used them without prescription. Nasal decongestants are considered as the most effective drugs that are used for rapid relief nasal obstruction. With their frequent usage, local adverse reactions are frequent. In this study, males presented around 60.2% while in another study the gender breakdown of the sample was 76.7% [1]. In relation to allergic rhinitis, the most chosen etiological factors for allergic rhinitis were hereditary as the etiological factor of 39.3%. Educational level was significantly associated with the identification of the etiological factor for allergic

**Table 2. Frequency of nasal decongestants use.**

<table>
<thead>
<tr>
<th>Variables</th>
<th>Frequency (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Number of times in a day</td>
<td></td>
</tr>
<tr>
<td>Once</td>
<td>191 (47.7%)</td>
</tr>
<tr>
<td>2-3 times</td>
<td>191 (47.7%)</td>
</tr>
<tr>
<td>more than 4 times</td>
<td>65 (14.5%)</td>
</tr>
<tr>
<td>Number of times per day</td>
<td></td>
</tr>
<tr>
<td>1-3 days</td>
<td>111 (28.24%)</td>
</tr>
<tr>
<td>4-5 days</td>
<td>318 (66.5%)</td>
</tr>
<tr>
<td>More than 5 days</td>
<td>25 (5.23%)</td>
</tr>
</tbody>
</table>

![Figure 3. Awareness of nasal decongestants adverse effects.](image)

![Figure 4. Level of Awareness Regarding the development of adverse effects after 3–5 days.](image)
Awareness of the Saudi population regarding nasal decongestants

rhinitis. The most commonly chosen symptom in the clinical picture of allergic rhinitis was sneezing and the least chosen symptom was a nasal itch. Other study showed sneezing was the most common symptom thought to be related with the allergy-related symptom, whereas loss of smell was the least one [5], the majority of our sample have been used nasal decongest for almost 4–5 days. However, 5.23% of the population have used for more than 5 days. Morris et al. observed an increase in nasal resistance after 3 days of treatment with oxymetazoline in healthy subjects [6]. Other authors recommend that present products be used only for “emergencies” and for not more than three consecutive days [7]. Our results demonstrated an upsurge in knowledge related to the side effects of nasal decongestants. Here, 56.2% of people were aware that it does have a side effect, 5.6% have chosen no, 29% chose maybe, and 10.8% chose No idea. We have also assessed level of awareness regarding the development of adverse events after 3–5 days, 28% chose yes, 31.1% chose no, and 40.7% chose “I don’t know.” The method of prescription was significantly associated with Age (p-value <0.05). In those who have used nasal decongestant, out of 447, 57.5% have noticed a significant improvement in their symptoms, 36.5% have noticed a mild improvement, and 6% did not notice any improvement at all.

Conclusion

In conclusion, nasal decongestants are considered as one of the most commonly available over the counter medications. Self-medication and lack of knowledge on nasal decongestants’ side effects may lead to complications to their users. Over the counter availability of nasal decongestants with no prescription may lead the population to believe that their use is free of risks and adverse effects. It is advised that nasal decongestants should be only available on a prescription basis. Health workers and advocates are recommended to improve patient awareness related to nasal decongestants safe use and side effects.

List of Abbreviations
PRO Patient-reported outcomes

Conflict of interest
The authors declare that there is no conflict of interest regarding the publication of this article.

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None.

Consent for publication
Informed consent was obtained from all the participants.

Ethical approval
Ethical approval was granted from both King Faisal University and the directorate of health before the study was conducted. King Faisal University, College of Medicine, 2/1/2019.

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References

Figure 5. Improvement after nasal decongestants.


