ORIGINAL ARTICLE

The relationship between smoking and allergic rhinitis

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Abstract

Background: Allergy rhinitis (AR), a chronic disorder affecting the upper respiratory system, is the most prevalent allergy illness in the world. It has been reported that tobacco smoking reduces atopy and increases the occurrence of rhinitis symptoms. **Aims of Study:** Therefore, the aim of this study is to evaluate the association between exposure to active smoking and the prevalence of rhinitis in the adult Saudi population. **Materials and Methods:** A self-administered questionnaire with closed-ended questions has been used in a cross-sectional quantitative investigation. Only authentic surveys that were given to Al-Kharj residents between May 2024 and March 2025 were included. We made use of 285 adults' examination survey data. The diagnosis of AR was made using the following query: Have you ever been diagnosed with AR by a medical professional? **Results:** According to the results, a significant portion of the group (81.40%) had never tried traditional cigarettes. 53 people (18.59%) used it occasionally, frequently, or every day. In reference to the correlation between smoking cigarettes and AR, 71 participants (24.9%) had a medical diagnosis of AR at some point in their lives. **Conclusion:** In Saudi adults, cigarette smoking only was linked to AR. To fully understand the health risks associated with smoking, more long-term research is required.

Key words: Allergic rhinitis, relationship, Saudi, smoking

INTRODUCTION

Along with asthma, other very frequent conditions around the world include allergic rhinitis, allergic dermatitis, and food allergies. In fact, 10–20% of people in the US and Europe suffer with allergic rhinitis.[1] It has been reported that tobacco smoking reduces atopy and increases the occurrence of rhinitis symptoms. In addition, smokers with allergic rhinitis (AR) did not significantly vary from non-smokers in terms of their nasal symptoms or quality of life. AR affects daily activities, sleep, quality of life, and performance at work or school, despite its varying degrees of severity. It is commonly disregarded, misdiagnosed, and mistreated, which has negative effects on society in addition to harming health.[2] Environmental factors are commonly cited as adjuvant factors for allergic sensitization and variability in

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clinical expression. These factors include exposure to both indoor and outdoor air pollution, altered lifestyle, bacterial and viral infections, geographic variations, socioeconomic conditions, and infant feeding.[3] Despite public health initiatives, exposure to tobacco smoke is still widespread and has been associated with a higher risk of certain upper respiratory disorders across a range of age groups. Exposure to tobacco smoke has been linked to significant correlations with AR, asthma, and chronic sinusitis.[4] However, there has been inconsistent evidence about links between exposure to tobacco smoke and allergy sensitivity. There have been conflicting findings on the relationship between tobacco smoke exposure and immunoglobulin E-mediated allergy sensitization. Some studies have found no correlation at all, or even an inverse one.[5-7]

This implies that while tobacco use may enhance a person's risk of developing rhinitis, the process may or may not entail a heightened susceptibility to allergic sensitization. The relationship between tobacco exposure, allergic sensitization, and rhinitis remains unclear despite the high prevalence of both conditions and several upper respiratory conditions. There are not many extensive epidemiologic researches in the literature assessing the links between smoking exposure and these two illnesses. Thus, the purpose of this study is to assess the relationship between the prevalence of rhinitis in the adult Saudi population and exposure to active smoking.

MATERIALS AND METHODS

We conducted our study in accordance with the Research Guideline for the Use and Care, which was approved by the PSA University Ethical Committee. The study was authorized by Prince Sattam bin Abdulaziz University's deanship of scientific research and the standing committee of bioethics (SCBR) under approval number SCBR-444-2025.

A cross-sectional quantitative study using online Google Forms to provide a self-administered questionnaire with closed-ended questions to assess the association between adult respiratory and allergy disorders and tobacco use type in the Al-Kharj community. We only included surveys that are valid and distributed to Al-Kharj people between May 2024 and March 2025.

Participation in the study was anonymous and voluntary. All residents of Al-Kharj who are at least 18 years old, male and female, of any nationality, and who are married or not were included by removing certain survey items. Participants were free to decline participation at any moment and for any reason, and only completed surveys were included in this study. Participants who refused to provide their consent, could not read, or did not have a smartphone or tablet were not allowed to participate. Information gathered from questionnaire responses. The survey was sent in both Arabic and English via a separate social media platform. The following queries were posed to the participants. In your lifetime, have you ever smoked more than 100 cigarettes? And in the past month, have you ever smoked cigarettes? Participants were classified as "current dual users" if they responded "yes" to the first and second questions.

The following question was used to diagnose AR: Have you ever had a doctor diagnose you with AR?

IBM version 26 of statistical package for the social sciences was used to do the statistical analysis. Frequencies and percentages were used to display the category variables. To display frequencies, percentages, and *P* values, the Chi-square test was utilized to demonstrate the correlation between cigarette smoking and AR. The odds ratios and corresponding 95% confidence interval for the regression's results were displayed. $P < 0.05$ is considered as statistically significant.

RESULTS

Sociodemographic data

After removing those who declined to take part and those under the age of 18 years, the study evaluated the association between smoking and allergic rhinorrhea in Al Kharj City among 285 participants.

According to the gender breakdown, there were more males (72.98%) than females (27.01%).

In terms of academic achievement, 78.01% of participants had a university degree. According to the respondents' marital status, 80.70% were unmarried. 97.54% of participants were Saudi nationals. Students made up 74.73% of the workforce, but employment status varied [Figure 1].

Cigarettes smoking

The study looked at the attitudes and history of the participants regarding smoking cigarettes. The findings showed that a sizable percentage of the group (81.40%) had never tried regular cigarettes.53 participants (18.59%) used it few times, most days or daily used. The length of time spent smoking traditional cigarettes varied among those who did so; 32.07% of them reported smoking for more than 5 years. 13.20% of participants spent smoking traditional cigarettes <6 months.

The association between cigarettes smoking and AR

Regarding the association between cigarettes, smoking, and allergic, rhinitis, 71 participants (24.9%) diagnosed with AR by a doctor in their life. Eleven participants (15.49%) of them never used cigarettes smoking. 38.02% 27-persontobacco use and 46.47% on tobacco use [Figure 2].

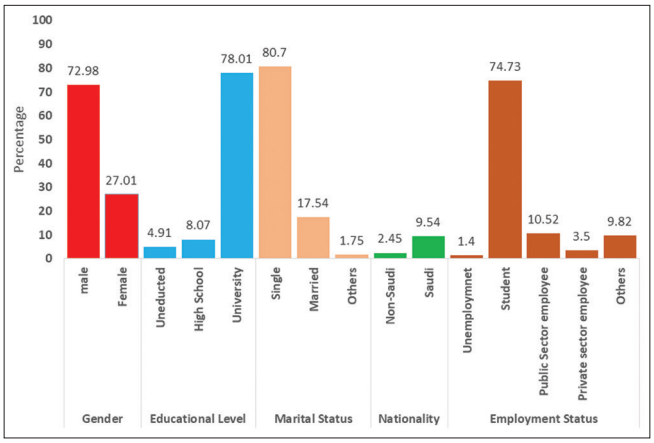

Figure 1: Graph showing the percentages of sociodemographic data

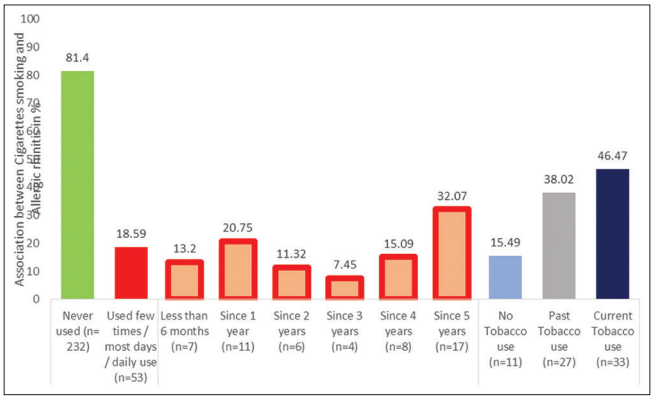

Figure 2: Association between cigarettes smoking and allergic rhinitis

DISCUSSION

The purpose of the current study is to look into the relation between exposure to active smoking and the prevalence of rhinitis in Saudi adults. According to our findings, 81.40% have never smoked regular cigarettes. In relation to the link between smoking cigarettes and AR, 71 participants (24.9%) had a medical diagnosis of AR at some point in their lives. A related study examined the association between Korean adult smokers' use of heated tobacco products and AR.[8] They discovered that AR was linked to the exclusive use of heated tobacco products. The relationship between heated tobacco products and the onset of AR is not well established. Recent research, however, has shown that tobacco contains unidentified substances not present in combustible cigarettes, as well as certain potentially dangerous substances such 2-propen-1-ol, glycidol, acetol, and propylene glycol.[9,10] Furthermore, a recent study found that smoking may have a distinct effect on the risk of vasomotor and AR, increasing the risk of vasomotor rhinitis and decreasing the risk of AR.[11] They found that smoking may be the only prevalent risk factor and that it may have the opposite effect on the risk of vasomotor and AR. Adult smokers and non-smokers having a clinical diagnosis of allergic rhinorrhea and a positive Skin Prick Test were the subjects of a cross-sectional study in another study.[12] In contrast to non-smokers, they found that active smokers do not exhibit a lower nasal-related quality of life or an effect on atopic inflammatory markers. These days, it is evident that the interplay between genes and the environment determines the severity of allergic respiratory conditions as asthma and AR.[13] The most prevalent environmental component linked to a number of airway illnesses, such as pediatric pneumonia, bronchitis, and rhinosinusitis, is most likely cigarette smoke.[14]

Nonetheless, there has been inconsistent evidence from earlier population-based research about a possible link between tobacco smoke and AR. Both previous and present secondhand tobacco smoke (SHS) exposure were found to be significant risk factors for AR in a study including 200 participants.[15] On the other hand, other research revealed a link between cigarette smoke and AR.[16] A previous study assessed the relationship between the prevalence of rhinitis and allergy sensitization in the adult US population and exposure to active smoking or SHS.[4] They discovered that Tobacco smoke exposure was associated with higher prevalence of rhinitis symptoms, but not with allergic sensitization. The findings suggest that adult sinonasal pathology and tobacco smoke exposure may be related in ways other than allergic sensitization. This study does, however, have a number of limitations. First, the relationship between exposure to active smoking use and illness risk was not assured because of the cross-sectional study design. To confirm the link between exposure to active smoking and respiratory and allergy disorders, more long-term research is required. Furthermore, diagnoses were made for life, and they can be impacted by prior medical conditions unrelated to tobacco use. Furthermore, there was no information on the frequency of disease exacerbations or the severity of the symptoms. It was impossible to predict how the diseases would develop based on changes in tobacco product use.

CONCLUSION

Among Saudi adults, the current exclusive smoking was linked to AR. Future research is required to determine the precise elements of active smoking that are linked to AR. Furthermore, additional longitudinal research on smoking's effects on different health outcomes is required to elucidate the negative health effects of active smoking.

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AVAILABILITY OF DATA AND MATERIALS

The data are available on request from the authors.

ETHICS APPROVAL

All series of steps that were implemented in this study that included animal models complied with Ethics Committee of Prince Sattam bin Abdulaziz University Institutional Review Board (SCBR-444/2025).

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