Respiratory Medicine (2005) **99**, 762–769

respiratoryMEDICINE

Alcohol-induced upper airway symptoms: prevalence and co-morbidity

Ulf Nihlen[a], Lennart J. Greiff[b], Per Nyberg[c], Carl G.A. Persson[d], Morgan Andersson[b,*]

[a]*Department of Respiratory Medicine and Allergology, University Hospital, SE-2218 5 Lund, Sweden*
[b]*Department of Otorhinolaryngology, Head & Neck Surgery, University Hospital, SE-221 85 Lund, Sweden*
[c]*Department of Caring Sciences, University Hospital, SE-221 85 Lund, Sweden*
[d]*Department of Clinical Pharmacology, University Hospital, SE-221 85 Lund, Sweden*

Received 20 April 2004

KEYWORDS
Alcohol;
Asthma;
Polyposis;
Rhinitis;
Wine

Summary Little is known about effects of alcohol intake on the upper, nasal airways. The present aim was to examine the prevalence of alcohol-induced nasal symptoms (ANS) and to explore associations between ANS and other respiratory diseases. A postal questionnaire focused on respiratory diseases and symptoms was sent to 11,933 randomly selected adult individuals. Subjects with ANS, $n = 316$ (3.4%) received a second questionnaire focusing on this condition. Nine thousand three hundred and sixteen (78%) subjects answered the first and 228 (72%) the second questionnaire. Two-thirds of the subjects with ANS were women. Red wine and white wine were the most frequent triggers of ANS, reported by 83% and 31% of the subjects, respectively. Nasal blockage was the most prominent symptom, but also sneezing, nasal discharge, as well as lower airway symptoms occurred after intake of alcoholic drinks. Self-reported physician's diagnoses of asthma, chronic bronchitis/emphysema, chronic obstructive pulmonary disease (COPD), as well as allergic rhinitis were more common in subjects with ANS compared with the general population ($P < 0.001$ for all comparisons). In conclusion, ANS are common and are about twice as frequent in women than in men. ANS seem to be associated with important respiratory diseases such as asthma, chronic bronchitis, COPD, and allergic rhinitis.

*Corresponding author. Department of Otorhinolaryngology, Head & Neck Surgery, University Hospital, SE-2218 5 Lund, Sweden. Tel.: +46 46 171705; fax: +46 46 211 09 68.
E-mail address: morgan.andersson@onh.lu.se (M. Andersson).

0954-6111/$ - see front matter © 2004 Elsevier Ltd. All rights reserved.
doi:10.1016/j.rmed.2004.11.010

Introduction

Rhinitis and asthma are chronic diseases with substantial impact on the quality of life of the affected patients. Both diseases also have important economic effects on the diseased persons, their families, and the society.[1] Rhinitis and asthma can have different underlying causes, but allergic sensitisation is the most common aetiology.

Airway symptoms are often triggered by inhaled factors that interact with the airway mucosal membrane. Some forms of rhinitis and asthma, however, may not be directly linked to this interaction. One such reaction is known as alcohol-induced asthma. Alcoholic beverages, notably red and white wines, are known to produce bronchial symptoms in certain individuals.[2–4] Nasal symptoms can also occur after wine intake,[2,5] but not much is known about the prevalence and presentation of alcohol-induced nasal symptoms (ANS). Little is also known about associations between ANS and common airway diseases such as allergic rhinitis, nasal polyposis, asthma and other chronic lower airway diseases.

In this study, we used two different questionnaires and determined the prevalence of ANS, and its potential associations with different nasal symptoms, triggering factors, and common chronic respiratory diseases. We analysed a large-scale questionnaire exploring respiratory symptoms and diseases in a random population sample in the most southern part of Sweden.[6] After that a second questionnaire specifically focused on alcohol-induced symptoms was sent to those who in the first survey reported ANS.

Methods

Study design

A first questionnaire was mailed out to a random population encompassing 11,933 men and women, aged 18–77 years. They were all randomly selected from the Swedish Population Register. It was mailed to the study population during the spring of 2000. If no response was received within two weeks a first reminder was sent out, and after ten weeks, a second, final reminder including a new questionnaire was mailed. Subjects who reported ANS were identified and received a second questionnaire, the ''Alcohol-Induced Rhinitis Questionnaire'' (Appendix A).

Study area and population

The study was performed in the southern part of Sweden. The study area included the city of Malmo (257,574 inhabitants), and ten of its surrounding municipalities. In total, 540,497 individuals resided within the study area.

Questionnaires

The first questionnaire included two parts, entitled ''Questions about the Lungs'' and ''Questions about the Nose'', respectively.[5,6] The questionnaire contained the same questions and had the same layout as the one used previously.[6,7] In addition to previous versions,[6,7] one question was added; ''Do you develop nasal symptoms after intake of alcoholic beverages''? In total, the questionnaire included 43 questions, and with most of the answer alternatives being ''Yes'' or ''No/do not know''.

The second questionnaire comprised questions designed for the present study. Briefly the subjects were asked whether or not they perceived runny nose, sneezes and/or nasal obstruction after alcohol consumption. Similarly they were asked whether or not they perceived breathlessness, wheezing, cough, itching, and/or headache. Furthermore, the subjects were asked to specify the beverages (red wine, white wine, sparkling wine, beer, sherry, port wine, hard liquor, brandy, whisky) that produced nasal symptoms. Moreover, whether or not the subjects had any other nasal diseases were assessed by specific questions with Yes or No/don't know answering alternatives. These questions included nasal allergy, nasal polyposis, and nasal hyperreactivity. Similarly the subjects were asked if they were sensitive to food containing preservatives and/or painkillers, like aspirin or non-steroidal anti-inflammatory drugs, and were both scored as yes or No/don't know. Finally, they were asked whether or not they used nasal medication on a daily basis or as needed.

Statistical methods

Results are presented as percentage of positive answers to a question. Non-responders to single questions are quoted, as ''no/do not know. The χ^2 test was used to examine differences in prevalence rates between groups. Multiple logistic regression analysis with adjustment for the influence of age, gender and smoking habits was used for calculation of odds ratios (ORs) for potential associations between different alcoholic beverages provoking ANS and lung symptoms as well as