Obstructive sleep apnea syndrome among a snoring community


ABSTRACT

Objectives: To evaluate the relation between snoring and the presence of obstructive sleep apnea (OSA) in terms of relevant health parameters and questionnaire responses.

Methods: Selective random sampling within a household survey in the cities of Al-Khobar and Dammam, Kingdom of Saudi Arabia over a 3 month period during the year 2000, was carried out. One hundred and fifty-two persons, aged 17-62 years, with a positive history of snoring as determined by the spouse or other members of the family were selected.

Results: The presence of OSA was determined using the Epworth sleepiness scale (ESS). The predictors included age, gender and body mass index. Snoring was found to be more associated with OSA as suggested by ESS in the study sample. The severity of snoring and its pattern are more associated with apneic patients.

Conclusion: Snoring is common and may be a serious medical problem. This study revealed that snoring is associated with symptoms suggesting OSA syndrome as detected by ESS. The family doctor and his team should be aware of the condition, using simple screening test such as ESS, improves the patient care, and finding of suspected cases.


Snoring is a major source of irritation for the snorer and his/her sleeping partner. It has been reported that 60% of men and 40% of women over 60 years of age snore.1,2 Habitual snoring occurs in 44% of middle-aged men and 28% of middle aged women.3 In the first large-scale epidemiological study on snoring 24% of men and 14% of women in San Marino were reported to habitually snore.4 The age adjusted prevalence rate of regular loud snoring among 1222 Hispanic-American adults was 27.8% in men and 15.3% in women.5 The frequency of snoring increases with obesity.6 Other major independent risk factors for snoring are male gender, age between 40 and 60 years, and cigarette smoking. Snoring increases with age up to 60-65 years.7 The prevalence of snoring is slightly increased in subjects who regularly use alcohol or hypnotics.8 Male predominance, observed in all epidemiological studies, remains unexplained. It may be due to differences in perception of snoring by men and women, or differences in airway collapsibility due to hormonal factors. The sound of snoring occurs when the soft palate and the tongue relax during sleep and vibrate the soft tissues at the back of the mouth. The tongue becomes retro-displaced falling posteriorly as a result of gravity and relaxation of the genioglossus (GG).9 Upper airway muscle activity during wakefulness is higher in patients with obstructive sleep apnea (OSA) than in non-snorers, suggesting that this activity may compensate for a smaller airway in such patients.10 This results in the condition known as sleep apnea hyponea syndrome.
Obstructive sleep apnea syndrome...Al-Rubaish et al

Self-reported loud snoring and observed breathing pauses (high likelihood of OSA) were associated with increased frequency of World Health Organization Grade 4 dyspnea, admissions to hospital with chest pain, myocardial infarction, raised blood pressure, and high levels of fasting blood sugar, fasting triglyceride (women only), and uric acid (women only) after adjustment for body fat distribution and other potential confounders. Multivariate analysis revealed that men who reported both snoring and EDS at baseline were at an increased risk of occupational accidents during the following 10 years. From a population based study involving 2668 individual, it was concluded that, in males aged 30-69 years, habitual snoring is associated with an increased incidence of diabetes within 10 years. An evaluation showed that 48% of the patients were acute vascular disease, mainly stroke and myocardial infarction, compared to only 30% of the controls who were habitual snorers. A logistic regression analysis showed that habitual snoring carries a significant risk factor for stroke and myocardial infarction, even after adjusting for other factors.

The prevalence of clinically significant OSA in the general population is high. It is found in at least 2% of women and 4% of men, making it as prevalent as asthma or diabetes. Obstructive sleep apnea with daytime impairment, is estimated to occur in one of 20 adults, is usually unrecognized and undiagnosed, and results in behavioral and cardiovascular morbidity. On the basis of the average of prevalence estimates from population-based cohorts in Wisconsin, PA, United States of America, and Spain of predominantly white men and women with mean BMI of 25-28 it is estimated that roughly one out of every 5 adults has at least mild OSA and one out of every 15 has at least moderate OSA. Although OSA is fairly common, it often remains undiagnosed in primary care practice. The vast majority of patients with OSA snore. The important issue, however, is not how common snoring is in patients with sleep apnea, but the converse that is, how common sleep apnea is among snorers. Several screening tools are used to determine OSA in the community. Among those is the Epworth scale test (EST) for daytime sleepiness. The Epworth Sleepiness Scale (ESS) developed by researchers in Australia and first published in 1991 was designed to measure subjective sleep propensity as it occurs in ordinary life situations. It is currently the most utilized subjective test of daytime sleepiness in clinical practice. The Epworth scale usually has strong correlation with the presence of OSA and with a degree of objective sleepiness. Johns conducted reliability and validation studies. The advantages of the ESS are that it is a validated, reliable tool for assessing subjective sleepiness and that it is able to distinguish normal patients from patients with sleep disorders. Epworth sleepiness scale scores to increase as a function of increasing severity of their sleep-disordered breathing. The association of Apnea-hypopnea index (AHI) with sleepiness was similar in subjects older and younger than age 65 years and was independent of sex, BMI, or evidence of insufficient sleep time. The objective of this study was to explore the prevalence of OSA among snorers using ESS.

Methods. A community survey of households was conducted over a 3 month period during the year 2000 in
Al-Khobar and Dammam, Kingdom of Saudi Arabia (KSA), using a random sampling technique. The map of the area was studied, and we used a random table to select the household; the subjects were then interviewed in the randomly selected household. Subjects participating in the survey were approached using pre-tested and pre-coded questionnaires. Face-to-face interviews were also carried out by a team of 3 nurses after receiving training on the use of EST to measure day time sleepiness. Only persons who had a positive history of snoring, as judged by the subject's spouse or members of family took part in the study. To determine the presence/absence of OSA among the survey sample EST for daytime sleepiness was used. The response of each participant to the 8 questions shown in Table 1 was scored on a scale of 0-3, and the total determined. A total score of 9 or more out of 24 suggest the presence of OSA. The survey was carried out over a 3 months period. All investigation instruments were translated into Arabic and the translation was checked by being re-translated into English. All information was gathered through interviews under the supervision of the first author. During the study period, 10% subsample of the questionnaire were rechecked for reliability by means of the Kappa index resulting 85% agreement.

Results. Sample characteristics. One hundred and fifty-two subjects (69 females and 83 males) that satisfied the inclusion criteria (Table 1) showed the mean and standard deviation of demographic features of the sample. The overall mean age was 31.6 ± 13.3 years; males more than females. Table 2

Obstructive sleep apnea as diagnosed with Epworth scale. When OSA was assessed according to EST 46 (30.3%) patients were found to be at risk of OSA. Of the 83 males, 36 (43%) had a positive ES test, in contrast of the 69 females only 10 (14.5%) had a positive EST (Table 3). The difference was statistically significant (p<0.001) with regard to the relation between positive EST test and self-reporting snoring pattern, 32 (71%) of 46 patients who scored positive in the EST reported waking up suddenly and unable to breathe. In contrast, only 10 (10.2%) out of 108 patients who scored negative in the EST reported this phenomenon, the difference was statistically significant (p<0.0001). In that respect, 32 (71%) patients were found to snore more while lying on their back and had more signs of apnea than others (p<0.0001). Indicating that among subjects who had positive EST, snoring was found to increase while they slept on their back, than those who had a negative EST. According to Epworth criterion (Table 1), 46 subjects were positive which constitutes a prevalence rate of 30.3% of all the study subjects, with male predominance.

A logistic regression model. A logistic regression model was applied to predict the snoring pattern according to those who showed positive EST at different age and sex groups. It was evident that the score of EST increased gradually with age; for example the higher the score the older the patient. (Odds ratio (OR)=1.07). Furthermore, males were at a greater risk of developing obstructive sleep apnoea according to EST than a female (OR=0.16).

Discussion. Obstructive sleep apnea with its associated snoring, creates an enormous burden on society and constitutes a serious health problem resulting in high morbidity and mortality and its attendant high medical costs if undiagnosed. The cardinal symptoms of OSA are snoring and excessive daytime sleepiness. However, both symptoms may be denied or minimized by the patient. Most symptoms of OSA occur during sleep. The patient may not be aware of it unless informed by his or her spouse. Observation by a member of the family of loud snoring, apnea or nocturnal choking may be the only reported hints. Patients with OSA may be misdiagnosed as having gastroesophageal reflux, dry mouth, hypertension, sore throat or polyuria. Sleepiness develops slowly over years and patients may forget what normal alertness is.
like. In our society, middle-aged women staying at home may not be aware of sleepiness unless it is very severe.

Although polysomnography (PSG) remains the gold standard diagnostic test for OSA, to be able to perform this test, the patient needs to spend at least one night in a sleep disorder center (SDC), where different physiological parameters can be continuously monitored and recorded by a trained sleep technologist. Due to the paucity of proper SDCs and well trained polysomnographic technologists, physicians have to rely on other methods to be able to screen patients for OSA. Among these are some anthropometric measures, such as, BMI, neck circumference, hip-waist ratio and history of snoring. Several simple questions have been adopted to screen for sleep apnea. Epworth sleepiness scale is among those and is widely used to screen for OSA. This is a simple questionnaire measuring the general level of day time sleepiness; for example the probability of falling asleep in a variety of situations. The conceptual basis of ESS involves a 4-process model of sleep and wakefulness. Epworth sleepiness scale is a simple and reliable method for measuring persistent daytime sleepiness in adults. Due to the fact that the prevalence of OSA ranges between 2-8% in any given community while its prevalence increases to about 30% among snorers, the idea of this study was developed. According to the best knowledge of the investigators, this is the first community based study conducted in the KSA. The study focused only on adults, although OSA is common also in children. Another survey will be needed to study this group. In accordance with reported literature, we have demonstrated a high prevalence of EDS among the snoring community (30.5%) which may suggest the diagnosis of obstructive sleep apnea. However, Tami et al. reported an incidence of OSA as high as 72% among patients with snoring referred for surgery. This is however; a highly selected population of patients; hence, the results may not be comparable to those of this study. It is not certain if, the snoring is a sequel or a contributing factor to the occurrence of OSA. Teculescu had suggested that the vibrations transmitted to pharyngeal structures by snoring span a large range of frequencies. A deleterious affect of these vibrations is mucosal injury and edema leading to airway obstruction and contributing to OSA. The association between the pattern of snoring and the severity of symptoms is quite obvious in this study. Subjects found to have OSA by (ESS) (71%) reports history of frequent arousals wake up suddenly and unable to breath causing sleep fragmentation and excessive day time sleepiness. Regular continuous snoring usually does not have sleep disturbing effects. However, discontinuous snoring associated with increased upper airway resistance leads to recurrent arousals. Males scored higher than females and they were older. This observation is similar to those of other studies. Using a logistic regression analysis we found that increasing age and male gender are significant predictors of OSA by ESS (Table 4). This has also been noted and confirmed by others. Epworth sleepiness scale is a simple screening tool for the sleep apnea syndrome. Primary health care doctors and other ambulatory health care team can be trained to detect OSA. This needs to be supported by formal sleep studies.

Approximately 60% of normal adults snore occasionally, and 40% are habitual snorers. The problem of snoring is more frequent in males and overweight persons, and it usually increases with age. When snoring is severe, it can cause serious, long-term health problems, including OSA. In this study using ESS, snoring was found to be associated with symptoms suggesting OSA syndrome. There is a great need for family doctors and the rest of primary care health providers to be aware of how to detect OSA among apparently normal individuals.

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References


