

The Prevalence of Asthma in an Adult Population in Khorramabad, Iran

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ABSTRACT

Objective: Asthma is one of the most common respiratory disorders. There have not been any studies assessing the prevalence rate for asthma based on spirometry in an adult population in the west of Iran. The aim of this study was to assess the prevalence of asthma in an adult population in Khorramabad, in the west of Iran.

Methods: This prospective cross-sectional study was done on adult residents in Khorramabad between 2009 and 2010. The samples were selected by cluster and systematic sampling methods. The interviewers went to the selected homes and evaluated the samples by the standard questionnaire of the European Community Respiratory Health Survey. The individuals who were susceptible to asthma were evaluated using a hand-held spirometer (ZAN 100, Obertulba, Germany). Also, in the patients whose first spirometry had been normal, a more than 10% reduction in forced expiratory volume in one second (FEV1) after the exercise and more than 12% rise in FEV1 after the salbutamol spray inhalation was considered as having asthma. Finally, the data were summarized using means and percentages.

Results: Eight hundred and fifty-seven adults were evaluated by the questionnaire and 450 suspicious cases were referred to the pulmonologist's office. The frequency of spirometry-diagnosed asthma in the adult residents of Khorramabad was 9.45%.

Conclusion: The prevalence of asthma in Khorramabad in our study was more than in similar studies in Iran and other countries. Doing analytical studies on the prevalence of asthma and its risk factors is recommended.

Keywords: Asthma, prevalence, spirometry

Prevalencia del Asma en una Población Adulta en Khorramabad, Irán

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RESUMEN

Objetivo: El asma es uno de los trastornos respiratorios más comunes. No ha habido ningún estudio espirométrico que evalué la prevalencia del asma en una población adulta del oeste de Irán. El objetivo de este estudio fue evaluar la prevalencia del asma en una población adulta en Khorramabad, en el oeste de Irán.

Métodos: Este estudio prospectivo transversal se realizó en adultos residentes en Khorramabad entre 2009 y 2010. Las muestras fueron seleccionadas mediante muestreos sistemáticos y muestreos por conglomerados. Los entrevistadores fueron a los hogares seleccionados y evaluaron las muestras usando el cuestionario estándar de la Encuesta de Salud Respiratoria de la Comunidad Europea. Europea de salud respiratoria comunidad estándar. Los individuos susceptibles al asma, fueron evaluados usando un espirómetro portátil (ZAN 100, Obertulba, Alemania). Además, en los pacientes cuya primera espirometría había sido normal, una reducción de más del 10% en el volumen espiratorio forzado en un segundo (VEF1) después del ejercicio, y una subida del 12% en el VEF1 después de la inhalación de un aerosol de salbutamol, era considerada como asma. Finalmente, los datos se resumieron usando promedios y porcentajes.

Resultados: Trescientos cincuenta y siete adultos fueron evaluados mediante el cuestionario, y 450 casos sospechosos fueron remitidos a la oficina del neumólogo. La frecuencia del asma diagnosticada por espirometría en los residentes adultos de Khorramabad fue 9.45%.

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Conclusión: *La prevalencia del asma en Khorramabad en nuestro estudio fue mayor que la mostrada por estudios similares en Irán y otros países. Se recomienda hacer estudios analíticos sobre la prevalencia del asma y sus factores de riesgo.*

Palabras claves: Asma, prevalencia, espirometría

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INTRODUCTION

Asthma is a chronic inflammatory disease. It is characterized by periodic airflow limitation, airway hyper-responsiveness and inflammation. These disorders lead to periodic symptoms such as wheeze or cough, especially at night. Asthma is one of the most common respiratory disorders; it affects 22 million Americans (1). Many studies reported that the prevalence of asthma is increasing (2–5).

There have not been any studies assessing the prevalence rate for asthma based on spirometry in an adult population in Iran. Also, there have been few studies assessing the prevalence of asthma in adults in Iran. The aim of this study was to assess the prevalence of asthma in an adult population in Khorramabad, a medium-sized city in the west of Iran.

SUBJECTS AND METHODS

This prospective cross-sectional study was done on adult residents in Khorramabad, in the west of Iran in 2009 and 2010. This study was approved by the research council of Lorestan University of Medical Sciences. The samples were selected by cluster and systematic sampling methods. The city area was divided into 10 clusters, and then four clusters were randomly selected. Afterwards, 300 homes in each cluster were systematically selected. The adult residents of each home who satisfied entry into the study were selected as the samples. The interviewers went to the selected homes and recorded the sample data. The samples were evaluated by the standard questionnaire of the European Community Respiratory Health Survey. The demographic information and symptoms of the samples were recorded. Then, the individuals who were susceptible to asthma were referred to a pulmonologist's office. All these persons were evaluated by spirometry test. Pulmonary function was evaluated using a hand-held spirometer (ZAN 100, Obertulba, Germany). The persons who had normal spirometry test exercised for 10 minutes. Five minutes after the end of the exercise, they were re-evaluated by spirometry test. A more than 10% reduction in forced expiratory volume in one second (FEV1) after the exercise was considered as asthma. Salbutamol spray was prescribed to the persons who had obstructive pattern on their spirometry test. Then, after 10 minutes, they were re-evaluated by spirometry. A more than 12% rise in FEV1 after the spray inhalation was considered as asthma. Otherwise, the diagnosis of chronic obstructive pulmonary disease (COPD) was performed. We obtained signed informed consent from all participants. In this study, we did not do any additional intervention than we routinely used for

diagnosis of asthma. As mentioned above, salbutamol spray was only prescribed to the persons who had obstructive pattern on their spirometry test. Prescription of salbutamol spray for the patients who have obstructive pattern is a part of the diagnosis of asthma that is routinely done in similar patients. Finally, the data were summarized using means and percentages.

RESULTS

Eight hundred and fifty-seven adults were evaluated by the questionnaire and 450 suspicious cases were referred to the pulmonologist. Based on the spirometry test, 81 (18%) of the referred persons had asthma. Thus, the frequency of spirometry-diagnosed asthma in the adult residents of Khorramabad was 9.45%.

Twenty-three (28.4%) of the asthmatic patients were male. The mean family members of the asthmatic patients was 5.09 ± 1.44 . Fifty-two (64.2%) of the asthmatic patients were married. The body mass index (BMI) levels of 25.9%, 70.4% and 3.7% of the asthmatic patients were 18.5–25, 25–30 and > 30, respectively. More than one-third (35.8%) of the asthmatic patients were unable to read or write; 7.2% of them were not illiterate but they had no high school diplomas, 35.8% had high school diplomas, 8.6% had associate degrees and 12.3% had a master's degrees or higher. All the patients had used natural gas as the fuel in their homes. Three (3.7%) and 13 (16%) persons were active and passive cigarette smokers, respectively. Also, 10 (12.3%) were hookah smokers.

In the past, the diagnosis of asthma had been made by a physician in seven (8.6%) of the asthmatic patients. Also, inhalation spray had been prescribed by a physician in 13 (16%) of the asthmatic patients. A family history of sudden death in sleep existed in 20 (30.8%) of the asthmatic patients.

DISCUSSION

Asthma is a common, worldwide disease that can increase hospital admissions and affect quality of life. Many studies report that the prevalence of asthma is increasing (2–5). Brogger *et al* reported that the crude prevalence of ever having had a physician's diagnosis of asthma in adults had increased from 3.4 in 1972 to 9.3% in 1998–99 in Oslo (2). Also, Hansen *et al* stated that the self-reported prevalence of asthma had risen significantly over a 15-year period among young adults in Copenhagen (3). Furthermore, Ruffin *et al* declared that the prevalence of doctor-diagnosed self-reported asthma in South Australia had risen from 5.6% in

1987 to 12.2% in 1997 (4). Fukutomi *et al* reported that the prevalence of asthma among adults in Fujieda City had constantly risen from 1985 to 2006 (5).

In the present study, the prevalence of spirometry-diagnosed asthma in the adult residents of Khorramabad was 9.45%. To *et al* reported that the prevalence of doctor-diagnosed asthma in the 18 to 45-year old persons from 70 countries was 4.3% (6). Dejsomritrutai *et al* declared that the prevalence of definite asthma in the adult population in Thailand was 2.91% (7). Tug and Acik stated that the percentages of those with doctor-diagnosed asthma living in rural and urban areas in Eastern Turkey were 5.5% and 3.1%, respectively (8). The prevalence of current asthma was 3.4% in Japan in the study by Fukutomi *et al* (5). In the United States of America, current asthma prevalence was 8.8% for women and 5.8% for men in the McHugh *et al* study (9). The prevalence of asthma in Iranian adults had been reported as 2.8% in Mashhad and 3.8% in Shahrekord (10, 11). The prevalence of asthma in Khorramabad in our study was more than in similar studies in Iran and other countries. This can be due to the socio-economic status of the people of this city. Moorman *et al* reported that asthma was more prevalent in poor persons (12). Although we have no exact information about the economic status of the participants, Lorestan is one of the most deprived provinces in Iran. Also, as mentioned in the results, 35.8% of the asthmatic patients in our study were illiterate.

In our study, the prevalence of active and passive cigarette smoking in the asthmatic patients were 3.7% and 16%, respectively. Also, the prevalence of hookah smoking in the asthmatic patients was 12.3%. The prevalence of smoking in the clinical asthmatic patients in the study by To *et al* was 23.3% (6). De Sousa *et al* declared that 12.3% of the 20–64-year old asthmatic patients in a Portuguese population had been smokers (13). Also, Rahimi-Rad *et al* stated that 16.4% of the asthmatic patients in Urmia, in the north west of Iran, were smokers (14). The prevalence rates of smoking in the above-mentioned studies were significantly more than in our study. But the prevalence of smoking in the present study is similar to that in the study by Dias-Júnior *et al*. They declared that the prevalence rates of smoking and passive smoking in asthmatic persons were 3% and 17%, respectively (15). The prevalence rate of cigarette smoking in our study in the asthmatic patients is lower than the reported prevalence rate of cigarette smoking in Iran. For example, Goli *et al* estimated that the prevalence rate of cigarette smoking in the Hamadan population (a city in the west of Iran) was 20.6% (16). This result is not in accord with the study by Parasuramalu *et al*. They reported that the prevalence of smoking in asthmatic men was 45.1% and in non-asthmatic men it was 26.8% (17). Tan *et al* reported that nocturnal symptoms and lower “emotional function” scores in the Asthma Quality of Life Questionnaire were more prevalent in the adult asthmatic patients that smoked (18). Also, van der Vaart *et al* stated that tobacco smoke in

asthmatic patients had a negative effect on lung function (19). Furthermore, Rahimi-Rad *et al* stated that asthma symptoms had been more prevalent in smokers than in non-smokers (14). The mentioned effects of smoking can affect the prevalence of smoking in asthmatic patients.

CONCLUSION

The prevalence of asthma in Khorramabad in our study was more than in similar studies in Iran and other countries. Doing analytical studies on the prevalence of asthma and its risk factors is recommended.

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AUTHORS' NOTE

The authors state no conflict of interest. AA assessed the patients, performed and interpreted the pulmonary function test and designed the study; SA collected the data; VA and AG wrote the article.

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