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### RESEARCH ARTICLE

## BRONCHIAL ASTHMA IN GERIATRIC POPULATION OF ARAR, NORTHERN SAUDI ARABIA: REVALENCE AND DETERMINANTS

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### Abstract

Old age is not a disease in itself, but the elderly are vulnerable to long term diseases. Bronchial asthma is one of the most common chronic diseases in Saudi Arabia, affecting more than 2 million Saudis. In the Kingdom of Saudi Arabia (KSA), asthma ranks 19th in terms of disability-adjusted life years (DALYs) and 26th in deaths. There are reports on its increasing pattern in KSA. There are very few studies on the prevalence of asthma in elderly in the Northern region of Saudi Arabia. **Aim of the study:** To study the demographic profile of elderly and to estimate the prevalence of self reported, previously diagnosed bronchial asthma and its determinants among the elderly population of Arar city, Kingdom of Saudi Arabia. **Subjects and methods:** This community based cross sectional study was conducted in Arar city, the capital of Northern Borders Governorate. Personal interviews with the 138 sampled elderly and filling the questionnaire, which guided us to the data of socio-demographic characteristics and bronchial asthma and its determinants. **Results:** characteristics of the sample showed that mean age ( $\pm$  SD) was 70 ( $\pm$ 9.25) years, male to female ratio was 47.8 to 52.3, married were 62.3 while 33.3 were widow, illiteracy constitutes 54.2%, primary school literates were 23.9% and total of 91.3% had less than secondary education.. The overall prevalence of bronchial asthma among studied elderly population was 14.4%. Current smoker were only 7.2%, 23.9% were ex-smokers while the majority (68.8%) were non smokers. Diabetics were 37% and 45.7% were obese. There is significant effect of smoking ( $P < 0.05$ ), but no significant effect of age, sex, diabetes mellitus or obesity on the occurrence of bronchial asthma among the studied elderly population ( $P > 0.05$ ). **Conclusion and recommendations:** In conclusion, bronchial asthma is a common health problems in elderly population in Arar, KSA. There is significant effect of smoking ( $P < 0.05$ ), but no significant effect of age, sex, diabetes mellitus or obesity on the occurrence of bronchial asthma. Health education curative and

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preventive programs is highly needed to protect and treat those vulnerable group.

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**Introduction:**

Respiratory disease has a major effect on morbidity and mortality at all ages. Chronic respiratory diseases represent a public health challenge in both industrialized and developing countries because of their frequency and economic impact. Asthma is a major health issue worldwide. It is among the top 30 highest-burden diseases based on the Global Burden of Disease 2010 study (GBD 2010) [1].

Bronchial asthma is a chronic inflammatory disease of the airways that causes narrowing of the airways, increased airway responsiveness to stimuli and hyper-secretion of mucus. The increased responsiveness of the airway leads to bronchoconstriction and the excess mucus production further blocks the airflow. Asthma is usually reversible, either spontaneously or with treatment. Nevertheless, it has significant effects on the elderly asthmatic's life. It may interfere with the everyday life and limit one's life-style choices [2].

Bronchial asthma is among the most common chronic illnesses of all age groups. A number of reports in the recent past suggest that the prevalence of asthma is increasing globally. There is uncertainty about the prevalence of asthma even in countries in which extensive epidemiological surveys have been carried out and attention has been drawn to a probable increase in prevalence [3].

In the Kingdom of Saudi Arabia (KSA), asthma ranks 19th in terms of disability-adjusted life years (DALYs) and 26th in deaths [1]. There are reports on its increasing pattern in KSA [3].

There are very few studies on the prevalence of asthma in elderly in the Northern region of Saudi Arabia. In patients hospitalized with respiratory diseases in King Abdulaziz University Hospital, Jeddah, Saudi Arabia, By far, asthma had the highest prevalence (38.6%) [4].

In individuals aged  $\geq 65$  years, living in mainland Portugal, the prevalence of physician-diagnosed asthma was 10.9% [5].

In Finland, the prevalence of current asthma was 2.9% in the men and 3.8% in the women [6]. Findings from a national household survey to study the Prevalence of asthma in Saudi adults in 2013 showed that, Prevalence of asthma varied slightly by KSA regions, the northern area was one from the areas with highest prevalence of asthma, it was 4.3-6.4% 5.9% in males and 10.1% in females aged 55-65 years and 9.9% in males and 11.9% in females aged 65 years and more and there was a slightly increasing trend from the third decade of life in both sexes [7].

In southwest Saudi Arabia, Al-Modeer et al., found asthma among elderly population was 4.8% (4.6% in males and 4.9% in females) [8].

In Geriatric Population in Fayoum Governorate, Egypt, Hassan et al found asthma prevalence 5.6% (4.5% in males and 1.1% in females with significant difference ( $P = 0.032$ ) [9].

In a study of morbidity pattern among geriatric population in an urban area of Udaipur Rajasthan bronchial asthma was found in 14% (11.5 in males and 18.2 in females) [10].

In eastern region of KSA, Qahtani AM et al, found bronchial asthma among elderly 65 - 85 years was 7.1% [11].

**Objectives:-**

To study the demographic profile of elderly and to estimate the prevalence of self reported, previously diagnosed bronchial asthma and its determinants among the elderly population of Arar city, Kingdom of Saudi Arabia.

**Participants and methods:-**

The present cross sectional community based study was conducted in Arar city, the capital of Northern Borders Governorate on 138 elderly people of age 60 years and more. The sample size was calculated using the sample size equation:  $n = z^2 p(1-p)/e^2$ , considering target population more than 1000, and study power 95%. Systematic random sampling technique was followed. After identifying the first house randomly in the selected area, every 9th house was visited to include all the elderly subjects residing in those selected houses till the required sample is covered. Data was collected through personal interviews with the sampled elderly and filling the questionnaire, which guided us to the data of socio-demographic characteristics and bronchial asthma and its determinants.

**Ethical considerations:-**

Data collector gave a brief introduction to the participants by explaining the aims and benefits of the study. Informed written consent was obtained from all participants. Anonymity and confidentiality of data were maintained throughout the study. There was no conflict of interest.

**Statistical analysis:-**

We utilized the statistical package for social sciences, version 16 (SPSS Inc., Chicago, Illinois, USA) to analyze the study data. The results were displayed as counts and percentages. The  $X^2$  test was used as a test of significance, and differences were considered significant at P value less than 0.05.

**Results:**

Table (1) illustrates the sociodemographic characteristics of the studied elderly population. The table showed that mean age ( $\pm$  SD) was 70 ( $\pm$ 9.25) years, male to female ratio was 47.8 to 52.2, married were 62.3 while 33.3 were widow, illiteracy constitutes 54.3% and 23.9% had primary education.

Table (2) illustrates bronchial asthma, smoking history, diabetes mellitus and BMI status in the studied elderly population. The overall prevalence of bronchial asthma among studied elderly population was 14.4%. Current smoker were only 7.2%, 23.9% were ex-smokers while the majority (68.8%) were non smokers. Regarding D.M and obesity, diabetics were 37% and 45.7% were obese.

Table (3) illustrates the relationship between bronchial asthma and age group, sex, smoking history, diabetes mellitus and obesity among the studied elderly population. there is significant effect of smoking ( $P < 0.05$ ), but no significant effect of age, sex, diabetes mellitus or obesity on the occurrence of bronchial asthma among the studied elderly population ( $P > 0.05$ ).

Table (1): socio-demographic characteristics of the studied elderly population, Arar, 2016 (n = 138)

Age group	No.	%
• 60-	90	65.2
• 70-	36	26.1
• 80+	12	8.7
Mean age ( $\pm$ SD)	70 $\pm$ 9.25	
Sex		
• Female	72	52.2
• Male	66	47.8
Marital status		
• Widow	46	33.3
• Single	3	2.2
• Married	86	62.3
• Divorced	3	2.2
Education		
• Illiterate	75	54.3
• Primary	33	23.9
• Preparatory	18	13.1
• Secondary or more	12	8.7

Table (2): bronchial asthma, smoking history, diabetes millets and BMI status in the studied elderly population, Arar, 2016 (n = 138)

Variables	No	%
<b>Bronchial asthma</b>		
• Yes	20	14.4
• No	118	85.6
<b>Smoking history</b>		
• Non smoker	95	68.8
• Smoker	10	7.2
• Ex- smoker	33	23.9
<b>Diabetes Millets</b>		
• Non diabetic	87	63.0
• Diabetic	51	37.0
<b>BMI (kg/m<sup>2</sup>) status</b>		
• Non obese	75	54.3
• Obese	63	45.7
Mean BMI (± SD)	29.99±9.73	

Table (3): the relationship between bronchial asthma and age group, sex, smoking history, diabetes millets and obesity among the studied elderly population, Arar, 2016

Age group	Bronchial asthma		Total (n=138)	Chi-Square	P value
	Yes (n=20)	No (n=118)			
• 60-	12(60.0)	78 (66.1)	90 (65.2)	0.853	0.653
• 70-	7(35.0)	29(24.6)	36(26.1)		
• 80+	1(5.0)	11(9.3)	12(8.7)		
<b>Sex</b>					
• Female	9(45.0)	63(53.3)	72(52.2)	0.213	0.404
• Male	11(55.0)	55(46.7)	66(47.8)		
<b>Smoking history</b>					
• Non smokers	9 (45.0)	86(72.9)	95(68.8)	7.102	0.02
• Smokers	2(10.0)	8(6.8)	10(7.2)		
• Ex-smokers	9(45.0)	24(20.3)	33(23.9)		
<b>Diabetes Millets</b>					
• Diabetic	7(35.0)	44(37.3)	51(37.0)	1.051	0.215
• Non diabetic	13(65.0)	74(62.7)	87(63.0)		
<b>Obesity</b>					
• Non obese	9(45.0)	66(55.9)	75(54.3)	1.318	0.177
• Obese	11(55.0)	52(44.1)	63(45.7)		

## Discussion:

Bronchial asthma is one of the most common chronic diseases in Saudi Arabia, affecting more than 2 million Saudis. Poor knowledge, fear of use of new drugs, and lack of awareness of the importance of control of the disease are common among primary care physicians caring for asthma patients in the Kingdom of Saudi Arabia [12].

This study was a cross-sectional study conducted in Arar city, Northern Saudi Arabia, in a representative sample of elderly people.

The present study showed that The age of elderly ranges from 60-92 years with a mean of mean age (± SD) was 70 (±9.25) years, male to female ratio was 47.8 to 52.2. in southwest Saudi Arabia by Al-Modeer et al, the age of elderly ranges from 60-104 years with a mean of 77.2 ± 8.9. Most of the elderly (55.9%) are females [8].

In the present study, 33.3 were widow, illiteracy constitutes 54.2%, primary school literates were 23.9% and total of 91.3% had less than secondary education. In Ibrahim et al in Jeddah, widowed elderly represented about one- fifth (21.8 %) of the sample which is less than our figure. The majority of elderly (78.4 %) had less than secondary

education which is better than our figure [13].Khadervalli et al [14] in their study reported only 27 % as illiterate and 31% as primary school literates.

In the current study, the overall prevalence of bronchial asthma was 14.4% This finding is more than finding reported in southwest Saudi Arabia by Al-Modeer et al, who found the overall prevalence of bronchial asthma among elderly population was 4.8%[8]. Findings from a national household survey to study the Prevalence of asthma in Saudi adults in 2013 showed that, the northern area was one from the areas with highest prevalence of asthma, it was 4.3 and 6.4% in elderly aged 55-65 years and 65 years and more respectively [7]. In eastern region of KSA in 2014, Qahtani AM et al, found bronchial asthma among elderly 65 - 85 years was 7.1% [11]. In Geriatric Population in Fayoum Governorate, Egypt, Hassan et al found asthma prevalence 5.6% [9]. In individuals aged  $\geq 65$  years, living in mainland Portugal, the prevalence of physician-diagnosed asthma was 10.9% [5]. All are less than our figure.

On the other hand, in Respiratory Health Survey in the United Arab Emirates, bronchial asthma was found in (15% and 16%) in females and males aged 60-64 years, which is consistent with our finding and 34% in females more than 65 years which is far more than our figure [15]. In geriatric population in an urban area of Udaipur Rajasthan bronchial asthma was found in 14% which is consistent with our figure [10].

In the present study, asthma was more prevalent in males than females with non significant difference ( $P > 0.05$ ). This finding is inconsistent with findings of many other studies. Al-Modeer et al, it was more in females than males with non significant difference [8]. In the national household survey to study the prevalence of asthma in Saudi adults showed that, the prevalence of asthma is different in both sexes, it was 5.9% in males and 10.1% in females aged 55-65 years and 9.9% in males and 11.9% in females aged 65 years [7]. In Finland, the prevalence of current asthma was 2.9% in the men and 3.8% in the women [6]. In urban area of Udaipur Rajasthan bronchial asthma was (11.5 in males and 18.2 in females) [10]. All are not supportive to our finding.

But our finding is consistent with findings in Fayoum Governorate, Egypt, asthma was more in males than females (4.5% in males and 1.1% in females with significant difference ( $P = 0.032$ ) [9].

Our study found significant association of smoking and asthma ( $P < 0.05$ ) and there was high rates of asthma among ex-smokers.

The fact that the relationship of asthma with ex-smoking is stronger than with current smoking has been shown in other studies as well. Some individuals stop smoking because of the onset of respiratory symptoms and are later diagnosed with asthma, and some individuals quit smoking because of diagnosed asthma. The association of smoking and asthma is strong and well documented [7, 16, 17].

Therefore, smoking prevention programs should be strengthened in KSA in order to reduce the burden of all diseases caused or aggravated by tobacco products (including asthma). Based on our data, exposure to secondhand smoking was associated with asthma attacks, which underscores the importance of tobacco-free settings.

### **Conclusion and recommendations:-**

In conclusion, bronchial asthma is a common health problems in elderly population in Arar, KSA. There is significant effect of smoking ( $P < 0.05$ ), but no significant effect of age, sex, diabetes mellitus or obesity on the occurrence of bronchial asthma. Health education curative and preventive programs is highly needed to protect and treat those vulnerable group.

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