

The Prevalence Rate of Adult Asthma in Rural Population of Bangladesh

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To determine the current prevalence rate of adult asthma in rural population of Bangladesh a random sample of 532 rural individual (age ≥ 20 years) were included in a cross-sectional study. We conducted this study in Jaldhaka Upzilla under Nilphamari district. The selected area is situated 325 kilometer away from Dhaka city. The sociodemographic characteristics of rural life defined for this study were the livelihood primarily related to the agriculture activities. All male and female ≥ 20 years of age were considered eligible except pregnant women and subject on medication. The eligible participants were informed about the objectives of the study. After providing the informed consent, each interested individual was requested to attend the nearby health care center. Each participant's was interviewed for the history of respiratory distress, wheeze, chest tightness, cough, allergy history of food, drugs or garments etc. Family history of asthma also interviewed to every participants. The other investigations included anthropometry and blood pressure. Measurement of height, weight, waist and hip girth were taken with light cloth without shoes. The prevalence of adult asthma was 10.90 (58/532). Out of 532 study subjects, 314 were male and 218 were female. The prevalence rate of asthma in male was 10.50% (33/314) and female was 11.46% (25/218). The association of asthma with several risk factors was recognized. The positive family history of asthma showed the strong association with asthma ($P < 0.01$). Smoking, positive allergy history and obesity was showed the association with asthma ($p < 0.01$). There was no relation of asthma with sex. The prevalence of asthma in the rural population was found to be increased compare to previous reports of Bangladesh and other Asian studies. Advanced age, obesity, higher incomes, family history of asthma, smoking and reduced physical activities were proved significant risk factors for asthma, whereas, sex, showed no association with asthma.

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Key words: Asthma, Prevalence, Anthropometry.

Introduction

The non-communicable diseases like hypertension, diabetes and asthma are emerging as a major health problem in Bangladesh. Recently, these are given high

research priority by the Government of Bangladesh. The prevalence of asthma is increasing but there is no current study on prevalence of asthma in our country.

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Asthma is characterized by chronic airway inflammation and increased airway hyper-responsiveness leading to symptoms of wheeze, cough, chest tightness and dyspnoea. It is characterized functionally by the presence of air flow obstruction which is variable over short periods of time or is reversible with treatment.

The prevalence of asthma is steadily over the later part of the last century in countries with a western life style and is also increasing developing countries. Current estimate suggest that 300 million peoples world-wide suffer from asthma and an additional 100 million may be diagnosed with asthma by 2025. In childhood, asthma is more common in boys but following puberty, females are more frequently affected. The socio-economic impact of asthma is enormous, particularly when poor control leads to days lost from school or work, hospital admission and for some patients, a premature death.

It is now estimated that as many as 300 million people of all ages, and all ethnic backgrounds, suffer from asthma and the burden of this disease to governments, health care systems, families, and patients is increasing worldwide.¹

Asthma is one of the most common chronic diseases in the world. It is estimated that around 300 million people in the world currently have asthma. Considerably higher estimates can be obtained with less conservative criteria for the diagnosis of clinical asthma. The international patterns of asthma prevalence are not explained by the current knowledge of the causation of asthma. Research into the causation of asthma and the efficacy of primary and secondary intervention strategies; represent key priority areas in the field of asthma research. Asthma has become more common in both children and adults around the world in recent decades.

The increase in the prevalence of asthma has been associated with an increase in atopic sensitization and is parallel by similar increases in other allergic disorders such as, eczema and rhinitis.² The rate of asthma increases as communities adopt western lifestyles and become urbanized. With the projected increase in the proportion of the world's population that is urban from 45% to 59% in 2025, there is likely to be a marked increase in the number of asthmatic attacks worldwide over the next two decades. It is estimated that there may be an additional 100 million people with asthma by 2025.³

Methods

A random sample of 532 rural individual (age ≥ 20 years) were included in a cross-sectional study. We conducted this study in Jaldhaka Upzilla under Nilphamari district. The selected area is situated 325 kilometer away from Dhaka city. The sociodemographic characteristics of rural life defined for this study were the livelihood primarily related to the agriculture activities.

Data Collection

All male and female ≥ 20 years of age were considered eligible except pregnant women and subject on medication. The eligible participants were informed about the objectives of the study. After providing the informed consent, each interested individual was requested to attend the nearby health care center. Each participant's was interviewed for the history of respiratory distress, wheeze, chest tightness, cough, allergy history of food, drugs or garments etc. Family history of asthma also interviewed to every participants. The other investigations included anthropometry and blood pressure. Measurement of height, weight, waist and hip girth were taken with light cloth without shoes.

Statistical Analysis

All data was recorded systematically in a preformed data sheet and was analyzed by relevant statistical procedures with the windows software version 12.0.

The prevalence rates of asthma were determined by simple percentage. Unpaired t-test, chi-square test was done to see the level of significance. All associations were tested by co-relation coefficient (r) test. All statistical tests were considered significant at the level of 95% ($p < 0.05$).

Table I: Characteristics of study subjects

Total study subjects	Sex		Age (years) Mean(\pm SD)		Age range (years)	
	Male	Female	Male	Female	Male	Female
N=532	314	218	44.04 \pm 12.86	42.91 \pm 12.59	20-70	20-70

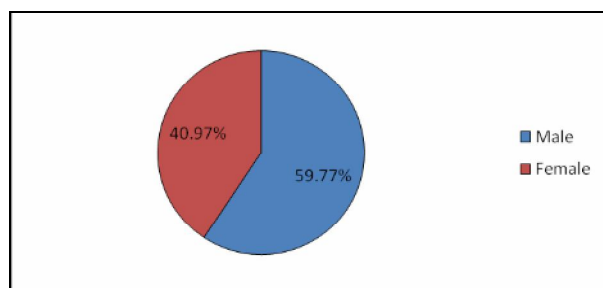


Fig1. Sex distribution of study subjects

Table II shows the frequency of asthma and non asthma in the study subjects. Out of 532 study subjects, 58 were asthma and 474 were not. Among the asthma patients, 33 were male and 25 were female respectively.

Table-II: Frequency of asthma and non asthma in the study subjects

Group	Male	Female	Total
Asthma	33	25	58
Non asthma	281	193	474

Statistical analysis: Frequency distribution

Results

Total 532 participants included in the study. Among them 314 were male and 218 were female. Their mean \pm SD of age in years were 44.04 \pm 12.86 and 42.91 \pm 12.59 respectively. The age range was 20-70 years both in male and female. Table-I shows the characteristics of the study subjects.

Table-III shows the comparison of asthma between male and female. There was no statistically significant difference between the two groups in the male and female.

Table-III: Comparison of sex in asthma and non asthma in the study subjects

Group	Sex of the study subject		Chi-square value	p-value
	Male	Female		
Asthma	33	25	.122	>0.05 (.778)
Non asthma	281	193		

Statistical analysis: Chi-square test

Table IV shows the comparison of age in asthma and non asthma in the study subjects. Among the study subjects, the asthma patient's mean \pm SD of age were 49.17 \pm 11.27 and non asthma participant's mean \pm SD of age were 42.89 \pm 12.76. There was statistically significant difference in the mean \pm SD of age between the two groups ($p < 0.001$).

Table IV: Comparison of age (years) in asthma and non asthma in the study subjects

Group	Mean±SD (age in years)	t-value	p-value
Asthma	49.17±11.27	3.582	<0.001 (0.000)
Non asthma	42.89±12.76		

Statistical analysis: Unpaired 't' test

The study subjects were stratified in different age groups and prevalence of asthma was observed in irrespective of sex distribution which shown in table - V & figure -2.

Table V: Prevalence of adult asthma in different age group of all study subjects

Age group (years)	Asthma	Non asthma	Total	Percentage
20-30	5	108	113	4.42%
31-40	9	118	127	7.08%
41-50	19	118	137	13.66%
51-60	17	87	104	16.51%
61-70	6	31	37	15.91%
Total	58	474	532	10.90%

Statistical analysis: Frequency distribution

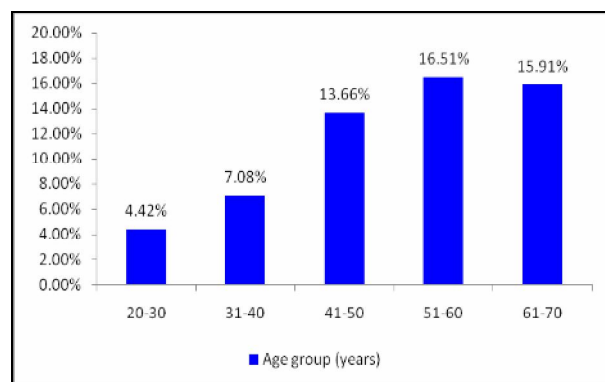


Fig 2. Prevalence of adult asthma in different age group of all study subjects

Table VI and Fig 3 shows the prevalence of adult asthma in all study subjects. Out of 532 study subjects, 58 were asthma and 474 were

not. The prevalence rate of asthma and non asthma was 10.90% and 89.09% respectively.

Table VI: Prevalence of adult asthma in all study subjects

Total study subjects	Group	Frequency	Percentage
N=532	Asthma	58	10.90%
	Non asthma	474	89.09%

Statistical analysis: Frequency distribution

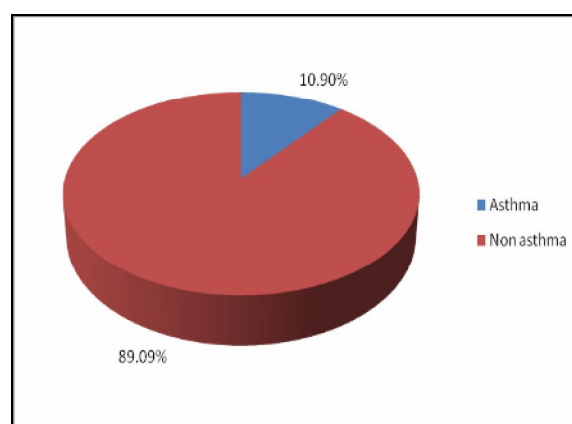


Fig 3. Prevalence of adult asthma in all study subjects

Among the 532 study subjects, 314 were male and 218 were female. Out of 314 male, 33 were asthma and 281 were not asthma. Out of 218 female, 25 were asthma and 193 were not. The prevalence rate of asthma in male and female was 10.50% and 11.46% respectively (Table VII & Fig 4).

Table VII: Prevalence of adult asthma in male and in female of all study subjects

Sex	Asthma	Non asthma	Total	Percentage
Male	33	281	314	10.50%
Female	25	193	218	11.46%

Statistical analysis: Frequency distribution

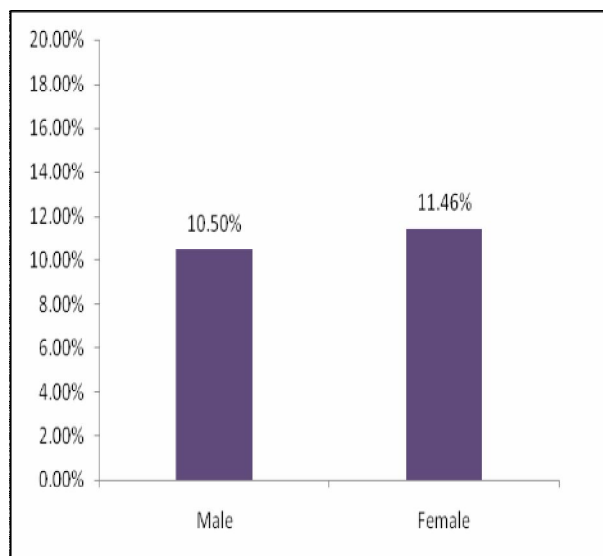


Fig 4. Prevalence of adult asthma in male and in female of all study subjects

Table VIII examines the correlation of asthma with sex, family history, occupation, annual income, obesity and smoking of all study subjects. There was statistically significant association of asthma with family history ($p < 0.01$), smoking ($p < 0.01$) and obesity ($p < 0.01$). But no statistically significant association of asthma with annual income and sex was recognized.

Table VIII: Correlation of asthma with family history, smoking, allergy history, obesity, sex, occupation and annual income of all study subjects

Correlation of asthma with	r-value	p-value
Family history	.175	<0.01
Smoking	.194	<0.01
Allergy history	.961	<0.01
Obesity	.125	<0.01
Sex	.015	>0.05
Annual income	.067	>0.05

Statistical analysis: Correlation co-efficient (r) test

Discussion

In this cross-sectional study, our aim was to explore the prevalence of asthma in the rural population of Bangladesh. The response was satisfactory. In our study, we interviewed the history of respiratory distress, wheeze, chest tightness, cough, allergy history of food, drugs or garments etc. Family history of asthma also interviewed to every participants.

In this cross-sectional study the total study subjects were 532. Out of 532, 314 were male 218 were female. The prevalence rate of asthma in male was 10.50% and that of in female was 11.46%. This study showed that the current prevalence rate of asthma (10.90%) was higher than the previous report of Bangladesh (4.4%) and it was also higher than the other Asian countries, Iran (2.4%) and India (4%).⁴ Smoking was a significant risk factor for asthma in our population. Studies done recently in general population have shown a positive association of smoking and asthma.⁵ A study done in Korean population showed active smoking to be risk factor for asthma. In their study also showed that positive allergy history is associated with asthma ($p < 0.01$).⁶ Allergy acts as a predisposing factor for development of asthma. This study revealed that positive family history, smoking, allergy history and obesity were associated with asthma, but there was no association of asthma with sex.⁷

Conclusion

The prevalence of asthma in the rural population was found to be increased compare to previous reports of Bangladesh and other Asian studies. Advanced age, obesity, higher incomes, family history of asthma, smoking and reduced physical activities were proved significant risk factors for asthma, whereas, sex, showed no association with asthma.

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