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Original Research Article

To Investigate the Variables That Increase the Risk of Severe Asthma in Adult Patients and the Sorts of Therapy That May Alleviate That Risk: A Retrospective Study

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Abstract

Aim: Risk Factors and Treatment Types for Asthma Severity among Adult Patients.

Material and Methods: This retrospective study was done the Department of Pulmonary Medicine, Lord Buddha Koshi Medical College and Hospital, Saharsa, Bihar, India for one year. All asthmatic patients whose ages were greater than or equal to 20 years in chronic illness, medication and follow-up clinic for asthma treatment.

Results: A total of 120 respondents, 100 were included in the final analysis. From total units in the study, 20 (20%) severe, 30 (30%) moderate, and 50(50%) were mild asthmatic patients, respectively. patients who were severely asthmatics 40% were female and 60% male. Those who were moderate asthmatic 30% were females and 70% were male. Percentage distributions of those who are mild asthmatic (60%, 40%) were female and male, respectively. The percentage distribution of asthma severity levels by different environmental factors. Out of total adult patients who were severely asthmatic 65%, 35% were registered in the dry season and rainy season, respectively. Of the total study unit who had asthma in childhood stage, 45%, 40%, 60% were severe, moderate, and mild asthmatic, respectively. Patients who had asthma in their family 35%, 40%, 58% were severe, moderate, and mild, respectively. The percentage distribution of asthma symptom seen in adult asthmatic patients are coughing (52%), wheezing (50%), dyspnea (44%), chest pain (25%), limited daily activity (10%), and rhinitis (6%). From 100 patients, who received oxygen (O_2) and prednisolone were 70(70%) 30(30%) respectively. The percentage distributions of beclomethasone, beclomethasone puff were equal which is expressed by 5%. Of all treatments distributed to asthmatic patients in a study unit, Salbutamol puff has a minimum percentage (4%) value.

Conclusion: The study showed that demographic, environmental, genetic, and health-related factors have a significant effect on asthma severity.

Keywords: Asthma, Severity, Salbutamol, Risk Factors.

Introduction

Asthma is a common and potentially serious chronic disease that can be controlled, but not cured and it causes symptoms such as wheezing, shortness of breath, chest tightness and cough that vary over time in their occurrence, frequency and intensity. Symptoms are associated with variable expiratory airflow that

means; difficulty breathing air out of the lungs due to bronchoconstriction (airway narrowing), airway wall thickening, increased mucus, symptoms may be triggered or worsened by factors such as viral infections, allergens, tobacco smoke, exercise, and stress. It is a major cause of school absence; work absence and healthcare expenditure on asthma are very high. [1]

Asthma imposes a large burden on the individual and on health care systems. Currently, asthma prevalence is approximately 10%-13% globally. Unexplained temporal and geographical variations in asthma prevalence have also been reported with asthma prevalence increased over the past few decades and higher asthma prevalence in Western nations. [2]

According to the World Health Organization survey report, the mean prevalence of asthma was 8.2% and 5.2% in poor countries and middle-income countries, respectively. In Africa suggested that greater than 50 million individuals have asthma. [3] The disease is more prevalent in developed countries with the highest rate seen in Australia (21.5%), Sweden (20.2%), United Kingdom (18.2%), Canada (14.1%), and the United States of America (10.9%). [3,4] Although not comparable with high- income countries, many low and middle-income countries are showing an increase in prevalence, increasing the overall world burden of asthma. [5]

In Africa problems, including those arising from the over-utilization of health services, lack of trained staff and diagnostic apparatus, and non-availability and un-affordability of inhaled medications have hindered efforts to improve the management of asthma. [6,7] Some of the African countries are shown to have high asthma prevalence, for example, South Africa (8.1%), Nigeria (7–18%), and Egypt (9.4%). [8] With respect to asthma prevalence in Ethiopia nationwide data addressing the adult population is lacking. Community-based studies done in Jimma reported a 4.9% prevalence of asthma. Other studies indicated 10.7% and 16.2% of the 12-month self-reported prevalence of wheezing in school children in Addis Ababa and Gondar, respectively. [9,10] Assessment of severity is essential to guide initial doses of medications and the frequency of subsequent medical review. [11,12] The severity of asthma varies within and between individuals and is judged according to symptoms and medication requirements. Chronic bronchial asthma is classified as intermittent or persistent asthma. The successful management of patients with asthma includes four essential components: routine assessment and monitoring, patient education to create a partnership between clinician and patient, controlling environmental factors and co-morbid conditions that contribute to asthma severity and pharmacological therapy. [12,13]

Material and Methods

This retrospective study was done the Department of Pulmonary Medicine, Lord Buddha Koshi Medical College and Hospital, Saharsa, Bihar, India for one year, after taking the approval of the protocol review committee and institutional ethics committee.

Inclusion Criterion

All asthmatic patients whose ages were greater than or equal to 20 years in chronic illness, medication and follow-up clinic for asthma treatment

Exclusion Criterion

Asthmatic patients whose ages were less than 18 years, patients lost from follow-up medication or clinic and pregnant ladies (due to the effects of pregnancy on asthma) were excluded from this study

The data were collected by developed structured questionnaires and guidelines from Self-report, direct observation,

interview, and chart review of Asthmatic patients during the checkup and follow-up of patients

Results

From a total of 120 respondents, 100 were included in the final analysis. From total units in the study, 20 (20%) severe, 30 (30%) moderate, and 50(50%) were mild asthmatic patients, respectively.

Table 1: shows that patients who were severely asthmatics 40% were female and 60% male. Those who were moderate asthmatic 30% were females and 70% were male. Percentage distributions of those who are mild asthmatic (60%, 40%) were female and male, respectively. For patients who are severely asthmatic, 45% were rural residents, 55% were urban residents. Of the patients who were moderate asthmatic 46.67% were rural, 53.33% are urban residents. Of the patients who are mild asthmatic 62% were rural, and 38% were urban residents.

Table 1 Percentage Distribution of Asthma Severity Level by the Levels of Demographic Factors

Demographic Factors				
Factors	**Category**	**Severity Levels (%)**		
		Severe=20	**Moderate=30**	**Mild=50**
Sex	Female Male	8(40) 12(60)	9(30) 21(70)	30(60) 20(40)
Residence	Rural Urban	9(45) 11(55)	14(46.67) 16(53.33)	31(62) 19(38)
Education	Illiterate Literate	9(45) 11(55)	18(60) 12(40)	27(54) 23(46)

Table 2: also shows that the percentage distribution of asthma severity levels by different

Environmental Factors				
Factors	**Category**	**Severity Levels (%)**		
		Severe	**Moderate**	**Mild**
Season register	Dry Rainy	13(65) 7(35)	14(46.67) 16(53.33)	23(46) 27(54)
Smoking habit	Smoker Non-Smoker	11(55) 9(45)	12(40) 18(60)	24(48) 26(52)
Exercise (regular)	Yes No	7(35) 13(65)	9(30) 21(70)	32(64) 18(36)
Cooking habit	Yes No	11(55) 9(45)	15(50) 15(50)	19(38) 31(62)
Allergens to pollen	Yes No	11(55) 9(45)	12(40) 18(60)	27(54) 23(46)
Allergens to pet	Yes No	6(30) 14(70)	12(40) 18(60)	35(70) 15(30)
Allergens to dust	Yes No	8(40) 12(60)	14(46.67) 16(53.33)	29(58) 21(42)

Environmental factors. Out of total adult patients who were severely asthmatic 65%, 35% were registered in the dry season and rainy season, respectively. Of those moderate asthmatic patients 46.67%, 53.33% were registered during the dry and rainy season, respectively. And from mild asthmatic patients 46%, 54% were registered in a dry and rainy season, respectively. Of patients who had a habit

of regular physical exercise 35%, 30%, 64% are severe, moderate, and mild asthmatic patients, respectively. And from the total study unit who had a regular cooking trend 55%, 50%, 38 were severe, moderate, mild asthmatic, respectively. Of the total study unit who are living with an allergen to pet 30%, 40%, and 70% was severe, moderate, mild asthmatic, respectively.

Similarly, Table 3 shows that the percentage distribution of asthma severity level by the levels of different genetic and health-related factors. From the study unit who had depression, 40%, 46.67%, 54% were severe, moderate, and mild asthmatic, respectively. Of the total study unit who had asthma in childhood stage, 45%, 40%, 60% were severe, moderate, and mild asthmatic, respectively. Patients who had asthma in their family 35%, 40%, 58% were severe, moderate, and mild, respectively.

Table 3 Percentage Distribution of Asthma Severity Level by the Levels of Genetic and Health-Related Factors

Genetic and Health-Related Factors				
Factors	**Category**	**Severity Levels (%)**		
		Severe N=20	**Moderate N=30**	**Mild N=50**
Depression	Yes	8(40)	14(46.67)	27(54)
	No	12(60)	16(53.33)	23(46)
Asthma in	Yes	9(45)	12(40)	30(60)
childhood	No	11(55)	18(60)	20(40)
Stress	Yes	9(45)	14(46.67)	31(62)
	No	11(55)	16(53.33)	19(38)
Family history	Yes	7(35)	12(40)	29(58)
	No	13(65)	18(60)	21(42)
Co-morbid illness	Yes	11(55)	14(46.67)	26(52)
	No	9(45)	16(53.33)	24(48)
Respiratory	Yes	11(55)	15(50)	24(48)
infection	No	9(45)	15(50)	26(52)
Body mass index	Under weight	5(25)	9(30)	15(30)
of patients	Normal	7(35)	9(30)	10(20)
	Over weight	4(20)	6(20)	20(40)
	Obese	4(20)	6(20)	5(10)

Table 4: shows that the percentage distribution of asthma symptom seen in adult asthmatic patients is coughing (52%), wheezing (50%), dyspnea (44%), chest pain (25%), limited daily activity (10%), and rhinitis (6%).

Table 4 Percentage Distribution of Asthma Symptoms Seen among Adult Patients in the Chronic Illness, Medication and Follow-Up patients

Symptom	Number of Patients	Percentage (%)
Cough	52	52
Wheezing	50	50
Dyspnea	44	44
Chest pain	25	25
Limits daily activity	10	10
Rhinitis	6	6

Table 5: From 100 patients, who received oxygen (O_2) and prednisolone were 70(70%) 30(30%) respectively. The percentage distributions of beclomethasone, beclomethasone puff were equal which is expressed by 5%. Of all treatments distributed to asthmatic patients in a study unit, Salbutamol puff has a minimum percentage (4%) value.

Table 5 Percentage Distribution of Treatments for Adult Asthmatic Patients at the Chronic Illness, Medication and Follow- Up patients

Treatment Types	Number of Patients	Percentage
Oxygen(O_2)	70	70
Prednisolone	30	30
Oral Salbutamol	11	11
Salmetrol Inhalation	10	10
Theophyin	8	8
Dexamethasone	7	7
Beclomethasone	5	5
Beclomethasone puff	5	5
Salbutamol puff	4	4

Discussion

From 100 patients included in the study, presenting asthma symptom seen in adult asthmatic patients treated with chronic illness, medication and follow-up were coughing (52%), wheezing (50%), dyspnea (44%), chest pain (25%), limited daily activity (8%), and rhinitis (6%). It is a chronic inflammatory disorder of the airways in which many cells and cellular elements play a role and this chronic inflammatory disorder may cause airway hyper-responsiveness that leads to recurrent episodes of wheezing, breathlessness, chest tightness and coughing. This study finding is comparable to the study conducted in Ethiopia in 2015, [15] Uganda in 2012,[6] and Denmark on the major symptom and sign seen among those diagnosed with asthma. Similarly, from total units in the study 130 (30.8%) severe, 132 (31.28%) moderate and 160 (37.91%) mild asthmatic, respectively. This study finding is relatively comparable with the study conducted in Ethiopia 2015; [15] in this study, the results are shown us high percentage value in each asthma severity level as compared to the study conducted in Malaysian health and morbidity (MHM SUR II) in 1996.

The drug prescribed to patients in chronic follow-up clinics of the University of Gondar Teaching Hospital (UOGTH) is not based on the Global Initiative for Asthma Management and Prevention (GINA) standard. The prescription asthma treatment was low, for example, over 11.85 of the patients received oral salbutamol therapy instead of inhaled salbutamol. The reason may be the cost because inhaled steroid and beta2 agonist are more expensive than oral salbutamol. The cost has been recognized as a factor in asthma medication use in many developing countries. The 70% of the patients received oxygen treatment. This finding may be due to less cost of oxygen than drugs. This result agreed with the study conducted in Uganda in 2012. The 30% of the patients received Prednisolone. This drug highly recommended in GINA, this result is almost agreed with the Global Initiative for Asthma Management and Prevention (GINA) 2014. [7,16] The percentage coverage who received theophyin drug was 8%. This result is relatively comparable with studies conducted in Ethiopian and India. [7,17] 7% of patients received dexamethasone.

This study has demonstrated that women, rural resident patients, patients who had a

habit of regular physical exercise, patients who were asthmatic in childhood stage, patients who live with a pet, patients who had depression, patients who had asthma in their family have a greater risk of having severe asthma than were not. And patients in the dry season and patients who were regular cookers were less likely to develop severe asthma.

The study shows that there is a significant association between sex and asthma severity. Females had more often severe asthma than men. This is due to the fact that in females, there is a relative change in work activity which leads to more opportunities to develop severe asthma. This result is comparable to the study conducted in England, [18] Sweden, [19] Indian, [20] and Columbia. [16] There is a significant difference in the asthma severity between urban and rural residential patients. This study showed that people living in rural areas were highly risked to develop severe asthma than people live in urban areas. The possible reason for the higher frequency of rural resident patients will be less understanding of factors of asthma than urban resident patients. This result is agreeing with the study conducted in India. [20]

This study also showed that the dry season is less likely to increase asthma severity than the rainy season. Since asthma is a thickening of the airway wall problem, this airway wall may relax in the dry season. This result was agreed with the study conducted in China 2015, Uganda. [6] This study showed that patients who had regular cooking habits were less likely to develop severe asthma. This result contradicts the study conducted in China,[2] England. [18] This contradicted result may be due to the study methodology difference that they use. Patients who live with the allergen to pets are highly risked to increase asthma severity. A dog or cat quickly becomes a member of the family, and unfortunately, many allergic animal lovers find themselves facing the daily discomfort of persistent allergy symptoms and this allergy symptom may lead to increased severity of asthma. This result is comparable to the study conducted in Sweden, [19] Columbia. [16]

In this study, the result showed that patients who had asthma in their family were highly risked to increase severity levels of asthma, suggesting that genetic factors play a central role in increasing asthma severity. This result agreed with the study in China2 and India. [20] Patients who were asthmatic in the childhood stage were highly risked for severe asthma in this study. Reactivity to inhalant allergens may increase with age. This result is agreeing with the study conducted in China2 and the Netherlands. Patients who were depressed were highly risked to develop severe asthma than among those who were not. Since depression is mental tiredness, this case psychological activity plays an active role in the genesis of asthma. This result is comparable with a study conducted in India, [20] and Columbia. [16]

Conclusions

The study showed that demographic, environmental, genetic, and health-related factors have a significant effect on asthma severity. And the dry season is less likely to asthma severity than the rainy season. Patients who had a habit of regular physical exercise, asthma in childhood, allergen to pet, depressed patients; patients who had asthma in their family history were more likely to develop severe asthma than were not.

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