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FACTORS RELATED TO SEVERE ACUTE ASTHMA ATTACK AND TREATMENT

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ABSTRACT

Asthma is a major public health burden that affects a large number of individuals. The prevalence of this chronic disease is very high in Bangladesh. This study is intended to understand the causes of disease and factors that contribute to its progression and to develop improved treatment strategies. The study population included severe acute attack of asthma patients admitted to National Institute of Diseases of the Chest and Hospital, Mohakhali, Dhaka, Bangladesh during October-December 2010. A questionnaire was prepared containing information of age, sex, family history, socio-economic status, food habits, allergic disorders, previous illness, smoking habit, diagnosed asthma, treatments and asthma medications used. Data were collected from a total of 100 patients of three wards in the hospital by face to face interview of patients, physicians and hospital recorded sheet over a period of three months. Out of 100 patients, 85% were male and 15% were female. The study showed 6% were below 30 years of age, 69% were ageing 30-60 years and 25% were above 60 years of age. It was found that 25% having family diseases from paternal side and 7% from maternal side. The study showed that 69%, 41% and 15% were habituated to cigarette, tea and betel leaf with tobacco leaf, respectively. All were from low socioeconomic group. Severe acute asthma attacks were initially clinically diagnosed and admitted to hospital. Emergency medical care was provided to all by oxygen, nebulization and steroid to improve respiratory disability. None was responded to inhaler alone. Treatment was given combination drugs according to severity. However, factors like age, gender, family history, habits are very important to analyze the disease progression and for selection of proper medications.

INTRODUCTION: Asthma is a chronic inflammatory disorder of the airways characterized by an obstruction of airflow, which may be completely or partially reversed with or without specific therapy. Severe acute asthma attacks do not respond to ordinary treatment with a bronchial inhaler. These attacks may lead to respiratory failure and require emergency acute asthma treatment.

Symptoms of a severe acute asthma attack include shortness of breath, breathlessness even while resting, a bluish tinge to the lips, tightness and noisy chest. Some patients may be observed standing and stretching in an attempt to open the airways, and they may exhibit confusion, agitation, and an inability to concentrate.

The risks for developing asthma depend on a complex interaction of hereditary and environmental factors. Risk factors are genetic predisposition (family history of asthma), prenatal factors (low birth weight, prematurity), and exposure to allergens, infections (respiratory infections, caused by respiratory syncytial virus), environmental air pollution, tobacco smoke, diet and obesity [1].

Asthma affects 5-10% of the population estimated 23.4 million persons, including 7 million children[2]. The overall prevalence rate of exercise-induced bronchospasm is 3-10% of the general population if persons who do not have asthma or allergy are excluded, but the rate increases to 12-15% of the general population if patients with underlying asthma are included.

Asthma affects an estimated 300 million individuals worldwide with a high negative impact on quality of life, productivity and health care costs [2]. Annually, the World Health Organization (WHO) has estimated 15 million disabilities for normal activity and 250,000 asthma deaths are reported worldwide[3]. Most likely due to income and geography, the incidence and treatment quality for asthma varies among different racial groups [4]. The prevalence of severe persistent asthma is also greater in low income communities than those with better access to treatment [4, 5].

The differences of the prevalence of asthma between countries were 20 to 60-fold and were more within developing countries than in developed countries [6]. The prevalence was also different between areas within country. Seven million people including 4 million children are affected from asthma related symptoms in Bangladesh [7]. Asthma was the second leading cause of death in Bangladesh in 2000 according to Bangladesh Bureau of Statistics [8].

Status asthmaticus is an acute exacerbation of asthma that does not respond to standard treatments of bronchodilators and steroids. Nonselective beta blockers have caused fatal *Status asthmaticus* [9].

Existing treatments for asthma focus on optimizing control of disease symptoms and preventing potentially life-threatening exacerbations. Population based studies to determine the magnitude of the severe acute asthma problem have not been carried out in Bangladesh. In this study, an attempt has been taken understanding the causes of disease and the factors that contribute its progression and develop improved treatment strategies.

MATERIALS AND METHODS: The present study was carried out on the basis of survey reports of severe acute asthma patients admitted to National Institute of Diseases of the Chest and Hospital, Mohakhali, Dhaka, Bangladesh during October-December, 2010. This hospital is a specialized hospital for asthma, chronic obstructive pulmonary disease (COPD), tuberculosis and other chest related diseases. Our study was conducted for only admitted severe acute asthma patients.

A questionnaire was prepared containing 16 questions and containing information of age, sex, family history, socio-economic status, food habits, allergic disorders, previous illness, smoking habit, diagnosed asthma, treatments, and asthma medications used. Data were collected from a total of 100 patients of three wards in the hospital by face to face interview of patient, Physician and hospital recorded sheet during three months study.

RESULTS AND DISCUSSION: Incidence of asthma is reported to be very high in minority populations and in people living in poverty [1, 10]. The economic burden to society is well documented on industrial countries [11, 12, 13]. In this study, asthma prevalence was observed high in males than females. Out of 100 patients, 85% male and 15% female were found (**Figure 1**).
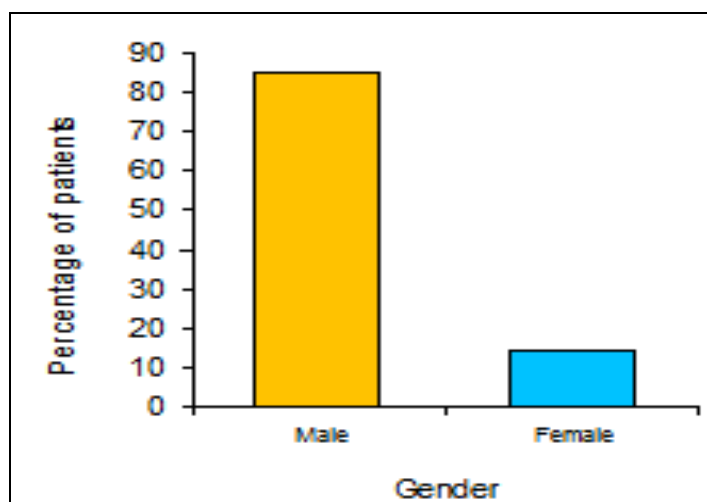

FIGURE 1: PERCENTAGE RELATION OF ACUTE ASTHMA PATIENT WITH GENDER.

The severity of asthma varies within individuals. It was also observed that patients were admitted in hospital while severe acute attack with poor socioeconomic status. This study also showed 6% were below 30 years of age, 69% were 30-60 years of ages and 25% were above 60 years of age (**Figure 2**). Asthma is a major chronic disease in a large number of individual of all ages. This difference is reflected in the number of emergency and is thought to reflect differences in risk factors of exposure and asthma control with socioeconomic status [14].
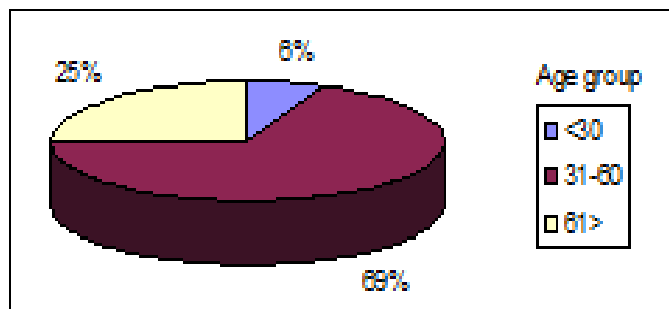

FIGURE 2: PERCENTAGE AGE PROFILE OF ACUTE ASTHMA PATIENTS.

Asthma is caused by environmental and genetic factors [15]. These factors influence how severe asthma is and how well it responds to medication [16]. The interaction is complex and not fully understood [17]. In this study, it was found that 25% having family history from paternal side and 7% from maternal side. Maternal tobacco smoking during pregnancy and after delivery is associated with a greater risk of asthma-like symptoms, wheezing, and respiratory infections during childhood [18].

Low air quality, from traffic pollution or high ozone levels has been repeatedly associated with increased asthma morbidity [19]. Factors that related with asthma development needs further research. Some individuals will have stable asthma for weeks or months and then suddenly develop an episode of acute asthma. Different asthmatic individuals react differently to various factors [20]. However, most individuals can develop severe exacerbation of asthma from several triggering agents [20, 21].

In this study, results have been showed 69%, 41% and 15% were habituated to cigarette, tea and betel leaf with tobacco leaf, respectively (**Figure 3**). The most effective treatment for asthma is identifying triggers, such as cigarette smoking. If trigger avoidance is insufficient, medical treatment is recommended. Medical treatments used depend on the severity of illness and the frequency of symptoms. Specific medications for asthma are broadly classified into fast acting and long acting [22].
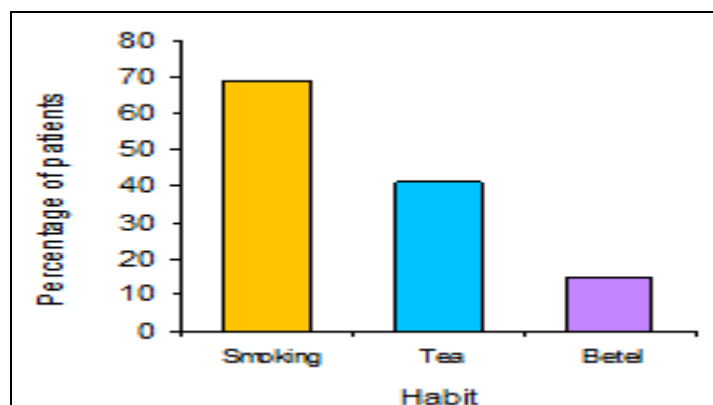

FIGURE 3: PERCENTAGE RELATION OF ACUTE ASTHMA PATIENT WITH HABITUATE TO SMOKING, TEA AND BETEL LEAF.

Avoidance of triggers is a key component of improving control and preventing attacks. The most common triggers include allergens, tobacco smoke, air pollution, non selective beta-blockers, and sulfite-containing foods [23, 24]. Severe acute asthma attacks that do not respond to ordinary treatment with a bronchial inhaler are often referred to as *Status asthmaticus*. These attacks may lead to respiratory failure and require emergency acute asthma treatment. In this study, 100 % patients required intensive care to prevent respiratory failure.

None responded to inhalers alone but in those cases a constant anti-inflammatory nebulizer was used along with injections of steroids such as hydrocortisone. The risks for developing asthma depend on a complex interaction of hereditary and environmental factors. Additional tests, such as oxygen saturation of the blood and peak expiratory flow, can help to determine if patients suffering from an acute asthma attack.

In more serious cases, a mechanical ventilator may be necessary until the lungs recover enough to resume breathing on their own. Antibody like anti IgE antibody (Omalizumab) was not administered to any of the patients. This type of medication should be tried where applicable. In addition, patients were monitored periodically to evaluate lung function and assured medications are working correctly.

CONCLUSION: We conclude that severe asthma attack is more prevalent in male than female in all ages. But the incidence is higher between 30 to 60 ages. Severity of this disease depends on the risk factors like genetic, socioeconomic status and smoking. However, smoking is an important contributing factor for this disease. Emergency medical care is needed in all patients and treatment of this disease is also depending on severity of disease. Patients do not respond to inhalers alone, a constant anti-inflammatory nebulizer used along with injections of steroids such as hydrocortisone.

Antibody like anti IgE antibody (Omalizumab) should be tried where applicable. This study was conducted in short duration therefore many other factors might not be explored. Further research is needed where related factors to be considered in prevention and treatment strategies of asthma attack.

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