

ADDIS ABABA UNIVERSITY
COLLEGE OF HEALTH SCIENCES
DEPARTMENT OF EMERGENCY MEDICINE AND CRITICAL CARE



A STUDY ON THE ASSESSEMENT OF PREVALANCE OF ASTHMA AND FACTORS THAT LEAD PATIENTS TO VISIT ADULT EMERGENCY ROOM OF ZEWDITU MEMMORIAL HOSPITAL, ADDIS ABABA, 2017.

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A THESIS SUBMITTED TO ADDIS ABABA UNIVERSITY COLLEGE OF HEALTH SCIENCES, DEPARTMENT OF EMERGENCY MEDICINE AND CRITICAL CARE FOR PARTIAL FULFILMENT OF THE REQUIREMENTS FOR MASTER OF SCIENCE DEGREE IN EMERGENCY MEDICINE AND CRITICAL CARE NURSING.

June, 2017

A.A, Ethiopia

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ACRONYMS

AAU: Addis Ababa University

AER: Adult Emergency Room

CDC: Center for Disease Control

COPD: Chronic obstructive pulmonary disease

CRD: Chronic Respiratory Disease

ED: Emergency Department

FMOH: Federal Ministry of Health

GBAR: Global Burden of Asthma Report

GINA: Global Initiatives for Asthma

HMIS: Health Management of Information System

LMIC: Low and middle income countries

PAHO: pan American health organization

SPSS: Statistical package for social sciences

URTI: Upper respiratory tract infection.

WHO: World health organization

ZMH: Zewditu memorial hospital

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ABSTRACT

Introduction: Asthma is a chronic inflammatory disorder of the airways. It imposes a large burden on individuals and health care systems so that periodic research on the prevalence and factors that lead patients to visit ER is mandatory for proper health care planning, management and prevention of the problem in order to reduce health care cost, morbidity and mortality thereby assuring productive citizens.

Objective: The objective of this study was to assess the prevalence of asthma and factors that lead patients to visit adult emergency room of Zewditu Memorial Hospital, Addis Ababa, Ethiopia, and 2017 GC.

Methodology: A descriptive institutional based crosssectional retrospective study was conducted in adult emergency room of Zewditu Memorial Hospital. Data was collected from HMIS record and then from personal health records of patients, who visited adult emergency room from February 1, 2016 to February 1, 2017. Finally it was analyzed with SPSS Version 20 and presented in tables and graphs.

Result: from the total 120 patients studied 55 (45.8%) were males and 65 (54.2%) were female giving a male to female ratio of 0.84 to 1.0. The prevalence of bronchial asthma was 1.5%. Majority of age group found in the age class of 34-43 years and 54-63 that accounts 31 (25.8%) and 25 (20.8%) respectively. Only 7 (5.8%) patients found in the age class of 14-23 years. The mean age of the patient was 46.73 with SD of 17.5. Most of the patients, 63 (52.5%) were moderate, 27 (22.5%) were mild and 30 (25%) were severe asthma. From the study subjects, 61 (50.8%) were forced to visit emergency due to exposure to allergen, 21 (17.5%) due to severity of asthma, 13 (10.8%) came due to drug compliance poor adherence to regular treatment) and the rest 25 (20.8%) had come due to other reasons like stress, exercise,

Conclusion: There was a low prevalence of asthma with no sex difference. The dominant symptoms found from the study subjects were wheezing, dyspnea and cough. Most patients classified as moderate asthma and most patients come to emergency due to exposure to different allergens. So health professionals in the ED should classify asthma severity properly according to GINA guide line and give regular education about the triggering factors of asthma.

Key Words: Prevalence, Emergency department, Asthma, ZMH

CHAPTER ONE

INTRODUCTION

1.1 BACKGROUND

Asthma is defined as a "chronic inflammatory disease of the airways" that can cause any or all of the following symptoms: -shortness of breath, tightness in the chest, coughing and wheezing [1]

Asthma is a chronic inflammatory disorder of the airways in which many cells and cellular elements play a role: in particular, mast cells, eosinophils, neutrophils (especially in sudden onset, fatal exacerbations, occupational asthma, and patients who smoke), T lymphocytes, macrophages, and epithelial cells [1]

Asthma is a highly prevalent disease that presents commonly to the emergency department (ED) in acute exacerbation. People with asthma are often referred to as "twitchy," meaning they seem to overreact to stimuli such as aero-allergens and cold, dry air. Over time, the airways, or bronchial tubes, become inflamed and sensitive. This increased inflammation, if not treated, will often lead to an asthma attack, which involves changes in the bronchial tubes and airways, in the following ways:

The muscles around the bronchial tubes tighten, causing the airways to narrow. This is known as bronchospasm or bronchoconstriction.

Mucus is produced within the bronchial tubes further restricting air flow [14]

Asthma is one of the most prevalent chronic diseases in the world and is considered a public health problem worldwide [1,2]. The prevalence of asthma in developed countries increased 50% per decade in the last 40 years of the 20th century, and approximately 250,000 deaths occur worldwide because of asthma each year [1].

Asthma is often associated with chronic rhinitis, which can be allergic or not. Studies indicate that 75% to 80% of the individuals with asthma have allergic rhinitis, and 40% to 50% of the individuals with allergic rhinitis and eosinophilic non-allergic rhinitis have bronchial hyperresponsiveness (BHR) [2-4]. Conservative estimates suggest that 500 million people have allergic rhinitis and 300 million people have asthma around the world [2-4]. The Pan American Health Organization (PAHO) estimates that there are approximately 15 million asthmatics in Brazil [16]

Asthma continues to be a serious public health problem. According to the Centers for Disease Control and Prevention; an estimated 23 million people, including over 6 million children, have asthma. Asthma prevalence is higher among persons with family income below the poverty level.. Asthma accounts for more than 15 million physician office and hospital outpatient department visits, and nearly 2 million emergency department visits each year.[17]

Asthma imposes a large burden on the individual and on health care systems. Currently, asthma prevalence is approximately 10%-13% globally.

Unexplained geographic variations in asthma prevalence have also been reported with asthma prevalence increasing over the past few decades and higher asthma prevalence in Westernized nations (15).

According to the World Health Organization, asthma is now a serious public health problem with over 235 million sufferers worldwide.

According to Statistics Canada, 8.5% of the populations (aged 12 and over) have been diagnosed as having asthma [21].

Asthma is most common during childhood and affects at least 13% of Canadian children. It continues to be a major cause of hospitalization of children in Canada.[14]. The WHO has reported that the levels of asthma control and health responses in the continent have been below recommended standards, and that these have contributed to the size of the disease burden [2]. In addition, although many African countries have national guidelines for the management of asthma and other CRDs, these guidelines have not been implemented in most rural areas [2]. Economic analyses in many African settings have shown that direct costs from asthma are usually greater than the indirect costs. It has been suggested that education of health care providers and the public is a vital element of the response to the challenge posed by asthma in Africa [2]

In Ethiopia this problem is coming another burden for the country next to those communicable diseases [5]. In one study conducted, in south west Ethiopia, asthma accounted for 2% of outpatient and 5.4% of medical admission and different risk factors are responsible for this

problem like poor compliance for the drugs, lack of awareness about the disease, low socio economic status and hyper sensitivity.[5]

1.2 STATEMENT OF THE PROBLEM

Chronic respiratory diseases represent a public health challenge in both industrialized and developing Countries because of their frequency and economic impact [15]. In developing countries, where poverty and non-communicable respiratory disease have long been linked [2, 3].Asthma is a major cause of chronic morbidity and mortality worldwide and represents a substantial economic and social burden throughout the world.[4]even though asthma most commonly developed in early child hood and more than three quarters of children who develop asthma symptoms before age 7,asthma can develop at any age in life including adult hood[9]. Most patients have poor access to health care; this is even true of the poorest minorities in industrialized countries. In developing countries, however, an additional problem is that health planners have limited resources [18]

Asthma is an important and increasing public health problem in Africa which receives inadequate priority and attention. With increasing urbanization, population aging, and adoption of western lifestyles in many African settings, these trends are set to continue in the near future. There is a need to identify and prioritize feasible strategies that can be adopted to promote the implementation of effective interventions that will address this increasing burden in Africa. There is also a need for African national governments to also consider effects of associated risk factors in public health policy planning on this topic with a focus on reducing environmental triggers, placing restrictions on tobacco adverts, and appropriately educating health care personnel and the public on the management of the disease and the preventive measures [19]

About 235 million people worldwide suffer by non-communicable diseases. The cause of asthma are not well understood but effective medicines are available that can treat it. Unfortunately for many people with asthma, particularly for the poor, this effective treatment are too costly or not available at all.[19]

According to the CDC (center for disease control) report, 10-11 million persons had acute attacks in 1998, which results in 13.9 million outpatient visits, 2 million requests for urgent care and 423,000 hospitalizations with a total cost of > 6 billion dollar.(5)

Asthma is often diagnosed after a long time because of the patients low medical seeking behavior and not knowing the exact triggering factor, this may be an important factor for increasing morbidity and mortality as a result of asthma.[4]

There are many factors that lead patients to visit the ED. The most common reported factors include asthma severity, poor compliance, the inappropriate use of inhalers and incorrect perceptions about asthma as a disease [10]. Asthma is the third-most common chronic disease in Canada which affects nearly 3 million Canadians. Severe Asthma (SA), a more acute form of asthma and a greater threat to the health, impacts the health and well-being of between 150,000 and 250,000 Canadians. Asthma is the leading cause of hospital admission in Canada [21]. This shows asthma has both health and economic impact.

Asthma is a common condition that affects 5-10% of the population. The incidence and prevalence of asthma have increased during the past 20 years. The prevalence of bronchial asthma among Saudi patients is approximately 20-25% [24]

A study conducted in Addis Ababa, Black Lion Referral Hospital 2015; the prevalence of bronchial asthma was 1.04 [25] which was low but different literature shows that asthma increases in urban area. That is why I am interested to study in AA.

1.3 SIGNIFICANT OF THE STUDY

This study will add knowledge on understanding of the prevalence and factors that lead to emergency. In addition the study may provide base line information about prevalence of asthma and it may be important for researchers who are interested. The data obtained in this study may have its own contribution for policy makers, clinicians for planning and evaluating the management of asthma.

CHAPTER TWO

LITRATUREREVIEW

Global estimate of asthma

Asthma is a major cause of morbidity and mortality and WHO estimates globally, 300 million are suffering with bronchial asthma with approximately 250,000 asthma related annual death.[6]

The global initiative for asthma (GINA) estimates that the global prevalence of asthma ranges from 1 to 18% of total population of different countries [6]. Though the prevalence and incidence of asthma is difficult to assess with certainty because of lack of reliable population based figures which used uniform diagnostic criteria, however, it has been suggested that approximately 5% of adult in USA and Australia have the disorder. There was a study conducted in Portugal on Prevalence of asthma which states that the prevalence of ‘_Diagnosed asthma’ was 5.0% (95%CI 4.2-5.8) and the ‘_Lifetime asthma’ prevalence was 10.5% (95%CI 9.5-11.6). In those with ‘_Lifetime asthma’, 72.8% had their first asthma attack before 18 years old, 25.5% between 19 and 64 years old and 1.7% after 65 years old. Prevalence was similar in men and women and in all age [11] and the study done In the Kingdom of Saudi Arabia in 2001, the prevalence of asthma was 12%. [12]

While in Malaysia, 73% outpatient clinic attendants are treated for respiratory symptoms and asthma is one and major cases. It is estimated that there is 1.6 to 2 million asthmatics in Malaysia [13]. The second Malaysian health and morbidity(MHM SUR II) conducted in 1996,had showed that the prevalence of asthma among the general population of Malaysia was 4.6 % in children and 4.1% in adults respectively.[13].It also revealed that 9.9% and 2.7% of asthma cases were moderate and sever forms that required hospitalization, respectively. There was a crossectional study from 2007-2009 in Malaysia in orangasli area showed that 1.2 % of prevalence in adults and (1.7%) in children. with regard to gender, it is slightly higher in females (1.7%) while (1%) in males. (13).

Whereas the systematic analysis done on an estimate of asthma prevalence in Africa estimated that a prevalence of 11.7% for asthma, totaling over 74 million people in 1990, and 2010 prevalence was 12.8%, about 120 million people. All the above result indicates the prevalence is

significant.(2) From studies based on written questionnaires, “asthma ever” (cumulative prevalence of asthma) was highest in South Africa (53%, 5-12 years) in 1997, followed by Egypt (26.5%, 11-15 years) in 2005, Nigeria (18.4%, 15-35 years) in 1995, and Ethiopia(16.3%, >20 years) in 1997. The lowest prevalence was recorded in Gambia (1.9%, >15years) in 1997. “Current wheeze” (wheeze at rest-12-months) was consistently high in South Africa, 26.8% (13-14 years) in 1994, 23.9% (5-12 years) in 1998, and 20.3% (13-14years) in 2003. From studies based on video questionnaires, “current wheeze” was highest in Morocco (12.9%, 6-7 years) in 2003 and Tanzania (12.3%, 9-10 years) in 2008, with South Africa recording the lowest prevalence (6.5%, 6-7 years) in 1995 and 2000, respectively; there was no reported prevalence of “asthma ever” from studies based on video questionnaires. However, from all studies, the pooled crude prevalence (weighted means) for “current wheeze” was 13.2% (male 10.8%, female 13.1%, mean age 18.4 years), and “asthma ever” was 6.6% (male 6.7%, female 6.3%, mean age 22.9 years) .

The study indicated that crude prevalence were consistently higher among urban dwellers than rural dwellers. “Current wheeze” was 9.6% (male 12.1%, female 7.0%, mean age 19.6 years) in urban settings and 7.0% (male 5.5%, female 3.8%, mean age 17.5 years) in rural settings.

“Asthma ever” prevalence was 5.9% (male 5.6%, female 3.9%, mean age 22.9 years) and 5.1% (male 4.2%, female 3.1%, mean age 17.5 years) in urban and rural dwellers, respectively [2]

The Economic Impact of Asthma

Disease related cost is usually classified in to direct cost, indirect cost and intangible cost. Direct cost include asthma management (e.g. visits to emergency services; hospital admissions; medications ,including all types of medications, such as over-the counter and alternative medicines; outpatient visits, including all human resources involved, such as doctors, nurses, paramedics, psychologists...), complementary investigations or treatments (e.g. imaging, skin and blood tests, lung function tests, pulmonary rehabilitation...)and other costs (e.g. domestic or professional preventive measures, assistance in home care, transportation to medical visits...).

Indirect costs include work-related losses (e.g. temporary disability in terms of partial or total lost-days; early disability; permanent disability...) and early mortality.

Finally, intangible costs are those related with unquantifiable losses, such as the decrease in quality of life, increases in pain or suffering, limitation of physical activities and job changes. These costs, unfortunately, are not yet systematically referenced in the literature on asthma costs. A lot of studies reported data on asthma costs, either at the individual patient, or on the society (regional level), and it can be an average annual per asthmatic cost of about \$USD 5,000, being much higher in severe asthmatics [16]

World-wide, the economic costs associated with asthma are estimated to exceed those of TB and HIV/AIDS combined.[18]

Along with lowering the quality of life for people with it, asthma levels a huge expense to the Canadian Health care system and individual Canadians. These costs are mostly reactive – that is, they are costs incurred to deal with a patient after an asthma attack.

Asthma is the leading cause of hospital admission in Canada. In 2011, Canadian emergency rooms dealt with 64,526 asthma-related events. Of these visits, nearly 27,000 patients were under the age of 19. A recent study shows that 30 percent of respondents reported having one or more emergency department visits each year.[18]

Asthma is a billion dollar problem in Canada. According to the Conference Board of Canada, the cost of hospitalization for asthma in 2010 was \$250,728,024. The physicians who cared for these patients cost \$196,321,334. The cost of asthma medication in 2010 was \$535,681,566. Indirect costs associated with asthma, including decreased productivity, are estimated at \$646 million. [21]

The annual economic cost of asthma—including direct medical costs from hospital stays and indirect costs, such as lost school and work days—amounts to more than \$56 billion annually [17]

What Causes Asthma?

Asthma is normally defined by symptoms rather than its underlying cause or causes. The causes of asthma are not presently known and appear to be very complex. Genetics, allergic reactions, hormonal changes, obesity, stress, exercise and environmental conditions can contribute to asthma or trigger asthma attacks. But asthma can also erupt spontaneously in some people. The

symptoms of asthma can recede without treatment, but often a person experiencing asthma will need treatment—medication or hospitalization—before they will be able to breathe comfortably on their own. Crucial research is still needed to help us understand why certain people are prone to asthma, and what types of asthma there are.[21] Asthma used to be thought of as an allergic disease, where allergen exposure causes sensitization to allergens and continued exposure leads to the processes in the airway which lead to asthma symptoms. While allergy is a potential underlying factor for up to half of the people with asthma, the remainder has no allergic features. In low- and middle-income countries the proportion of people with non-allergic asthma is greater than in high-income countries. Furthermore, some occupational causes of asthma do not appear to involve allergy. These non-allergic mechanisms are currently not well understood.[22] In industrialized countries the main risk factors for asthma are exposure to house mites, pollens, pets, and other sources of allergens. Other risk factors include acute respiratory infections, dietary factors, western“ lifestyle, and genetic factors. Asthma is more prevalent in urban areas and in adults younger than 40 years of age.[18]

The association between socioeconomic status and asthma is not simple. In studies from Ethiopia and Kenya, asthma prevalence was noted to be low in rural, subsistence areas, and higher in the urban areas in the same countries. Urban-rural differences in asthma prevalence are seen even in the United States,[2]

Severity of asthma

A study conducted in Malaysia in 2011, 9.9% patients had moderate asthma 2.7% patients had severe asthma. [13]

A study conducted by the Bahia State Asthma and Allergic Rhinitis Control Program (Programa de Control da Asthma e Rinite Alérgica Bahia - ProAR) in Brazil sought to evaluate the factors associated with severe asthma in the population [16]. Clinical data from 102 asthmatics treated in 2007–2008 were evaluated retrospectively.

The mean age was 44.0 years (\pm 13.6). Only 2.9% of the patients had mild asthma, 30.4% had moderate asthma, and 66.7% had severe asthma, as expected for a specialty service for asthma. From the study done in Addis Ababa Black Lion Referral Hospital in 2015 in adult emergency 49.9% were mild, 43.9% were moderate, 14.2 were severe.[25]

CHAPTER THREE

OBJECTIVE

3.1 General objective

- The objective of this study was to assess the prevalence of asthma and factors that lead patients to visit adult emergency room of Zewditu Memorial Hospital, Addis Ababa, Ethiopia, 2017.

3.2 Specific objectives

- To describe the socio-demographic characteristics of patients who visited AER of ZMH
- To determine factors that lead patients to visit AER of ZMH
- To assess the magnitude of asthma on patients who visited AER of ZMH
- To identify the outcome of asthma on patients who visited AER of ZMH

CHAPTER FOUR

METHODOLOGY

4.1 study design and study period

A descriptive institutional based cross-sectional study design was employed retrospectively from February 1, 2016 to February 1, 2017 in ZMH AA, Ethiopia. The study was conducted from December 2016 to June 2017.

4.2 Study area

The study was conducted in Addis Ababa which is the capital city of Ethiopia. Zewditu Memorial Hospital is located in Kirkos Sub City Woreda 08 Addis Ababa, Ethiopia. This Hospital was built, owned and operated by the Seventh-day Adventist church, but was nationalized during the military regime in 1976. The hospital is named after Empress Zewditu, the cousin and predecessor on the throne of Emperor Haile Selassie. Today Zewditu Hospital is operated by the Federal Ministry of Health (FMOH) under Addis Ababa Health Bureau. It has a total of 182 beds, 277 nursing staff and 62 staff physicians.

This hospital receives trauma and non-trauma patients, and serves as a referral hospital for critical emergency cases referred from other hospitals and health institutions.

4.3. Population

4.3.1. Source population

All patients who visited AER of ZMH from February 1, 2016 to February 1, 2017

4.3.2. Study population

All patients who visited AER of ZMH and diagnosed as a case of bronchial asthma from February 1, 2016 to February 1, 2017

4.4. Eligibility criteria

4.4.1 Inclusion criteria

All adult patients (whose age is >13 years) with bronchial asthma and visited adult emergency room of ZMH from February 1, 2016 to February 1, 2017.

4.4.2 Exclusion criteria

- Patients without diagnosis of asthma.
- Incomplete cards.
- Patients whose age ≤ 13 years.

4.5. Sample size determination and sampling procedure

4.5.1 Sample size determination

All adult patients who visited AER of ZMH and diagnosed as a case of bronchial asthma from February 1, 2016 to February 1, 2017 was selected.

4.5.2 Sampling technique and procedure

The researcher selected the study area by purposive sampling technique, which was not done previously in this hospital. No need of sampling technique because all patients visit adult emergency room and diagnosed as asthma during the study period as taken the study sample.

4.6. Variable of the study

4.6.1 Dependent variable

- Asthma prevalence
- Outcome

4.6.2 Independent variable

- Age
- Sex
- Recurrent URTI
- Occupation
- residence
- Smoking status
- Co -morbid disease (COPD, Pneumonia, other chronic disease)

4.7 Operational definitions

Asthma; is a common chronic inflammatory diseases of the air ways characterized by variable and recurring symptoms, reversible air way obstruction and bronchospasm.

Wheezing; is a continues, coarse, whistling sound produced in the respiratory air ways during breathing.

Coughing; is a sudden and often repetitively occurring reflex which helps to clear the large breathing passages from secretions, irritants ,foreign particles

Dyspnea; is the feeling or feelings associated with impaired breathing.

Allergy; is a hypersensitivity disorder of the immune system.

Intermittent asthma; symptoms (difficulty breathing, wheezing, chest tightness and coughing) occur on fewer than 2 days a week and not interfere with normal activity.

Mild asthma, if the speech is in sentences, , not use accessory muscle, respiratory rate is in 12 to 20, heart rate is in 60 to 100, oxygen saturation is $>$ or $=95\%$.

Moderate asthma, if the speech is in phrases, mental status is agitated, sometimes use of accessory muscle, respiratory rate is in 20 to 30, heart rate is in 100 to 120, oxygen saturation is in 90% to 95%.

Severe asthma, if the speech is in words, mental status is decreased, using of accessory muscle, respiratory rate is >30 , heart rate is >120 , oxygen saturation $<90\%$
(NB. The severity of asthma of is taken from GINA-pocket-2015)

4.8. Data collection procedures

4.8.1 Data collection instruments

The required data was obtained by preparing a structured checklist which was taken from other researches previously done.

4.8.2 Data collection technique

First patients with the diagnosis of asthma was retrieved from HMIS log book ,then the data was collected through gathering all medical records of patients with asthma who came in the study period .The data was collected by the researcher and other 4 assistants after giving a proper training.

4.9. Data quality management

Training was given for data collectors on how to use the questionnaire. The questionnaire was developed in English. The collected data was checked by the principal investigator on daily basis for completeness and consistency.

4.10. Data processing and analysis

Data entry was done using epiinfo version 7 and all analysis were performed using the SPSS version 20. The data was double entered and cleaned .Data was summarized using proportion, mean, standard deviation and median. Binary logistic regression chi-square test was done to see

association between independent and dependent variables. Results were considered significant at $P < 0.05$. Then the generated data was compiled by frequency tables, charts and graphs..

4.11. Ethical Consideration

The research proposal was sent for approval to the Research and Ethics Committee at College of Health Science, Addis Ababa University before I proceed to the study. Permission was obtained from ZMH hospital administration and the head nurse emergency department of the hospital to conduct the study.

4.12. Dissemination and Utilization of Results

The result will be submitted to Addis Ababa University College of Health Sciences department of emergency medicine & critical care and feedback will be given for ZMH. The finding will also be submitted for Federal Ministry of Health (FMOH).

CHAPTER FIVE

RESULTS

5.1 Sociodemographic results

From the total of 145 patients retrieved from HMIS log book, 120 patients fulfill the eligibility criteria. From these 55 (45.8%) were males and 65(54.2%) were female giving a male to female ratio of 0.84 to 1.0. Majority of age group found in the age class of 34-43 years and 54-63 that accounts 31(25.8%) and 25(20.8%) respectively. Only 7 (5.8%) patients found in the age class of 14-23 years. The mean age of the patient was 46.73, median of 43, mode of 40, standard deviation, 17.5. With regard to their residency 83(69.2%) were urban and 37(30.8%) were rural. Most of the patients are government employee 61(50.9%).

Table 1 *Socio-demographic characteristics of patients who visit AER of ZMH from February1, 2016-February 1, 2017.*

Characteristics	Frequency	Percentage (%)
AGE		
14-23	7	5.8
24-33	24	20.0
34-43	31	25.8
44-53	13	10.8
54-63	25	20.8
64-73	8	6.7
73-83	9	7.5
84-93	3	2.5
Total	120	100
SEX		
Male	55	45.8
Female	65	54.2
Total	120	100
RESIDENCY		
Urban	83	69.2
Rural	37	30.8
Total	120	100
OCCUPATION		
Farmer	19	15.8
Trader	15	12.5
Government employee	61	50.9
Self employee	25	20.8
Total		100

5.2 Prevalence of bronchial asthma

The total patients who visited adult emergency room of ZMH from February1, 2016 - Feb1, 2017 were 8030 .From these 120 patients (1.5%) were diagnosed with bronchial asthma.

Sign and symptom:

From 120 patients included in the study, 109 (90.8%) had wheezing, 97(80.8%) had cough, 102 (85%) dyspnea, 39(32.5%) rhinitis, 53(44.2%) sinusitis. 8(6.7%) atopic dermatitis

Table 2: Clinical manifestation of patients visited AER of ZMH from February1, 2016-February 1, 2017. Addis Ababa (n=120)

Clinical manifestations	Frequency	Percentage (%)
Wheezing		
Yes	109	90.8
No	11	9.2
Cough		
Yes	97	80.8
No	23	19.2
Dyspnea	102	85
Yes		
No	18	15
Limits daily activities		
Yes	95	79.1
No	25	20.9
Rhinitis		
Yes	39	32.5
No	81	67.5
Sinusitis		
Yes	53	44.2
No	67	55.8
Atopic Dermatitis		
Yes	8	6.7
No	112	93.3
Cyanosis		
Yes	35	29.2
No	85	70.8
Altered Mental status		
Yes	33	27.5
No	87	72.5

5.3 Severity of bronchial asthma

From patients included in the study (n=120), 63(52.5%) were moderate, 27 (22.5%) were mild and 30(25%) were severe asthma.(fig.1)

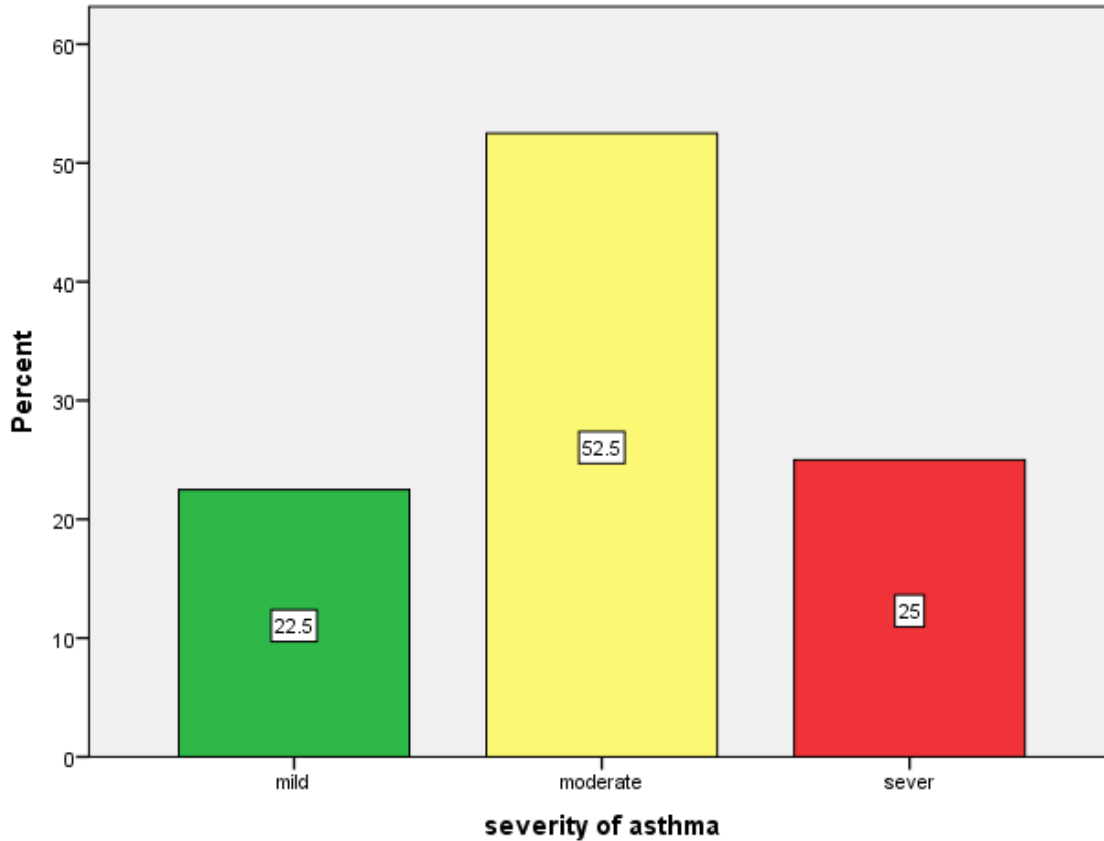


Fig.1 severity of asthma

5.4 Smoking status of patients

From the sample n=120, most patients 70(58.3%) patients smoking status is unknown, 34(28.3%) were non-smokers and the rest 16(13.3%) were smoker.(Fig.2)

To consider smoking as a predisposing factor difficult because most of them their smoking status is unknown.

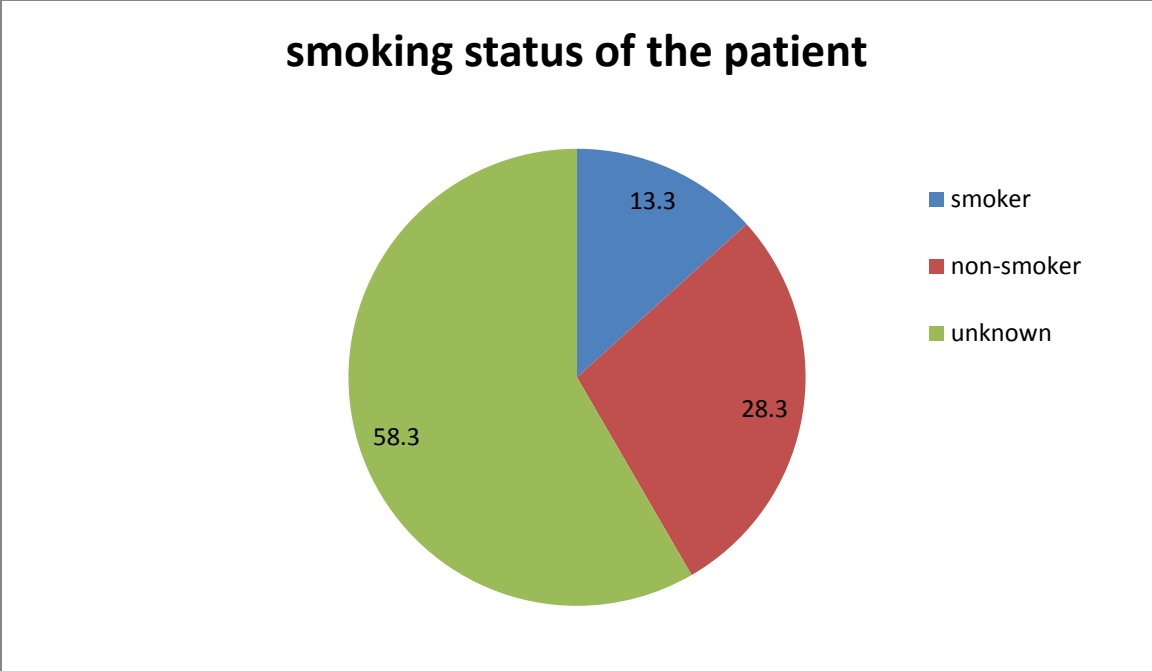


Fig.2 Smoking status of patients

5.5 Factors that lead patients to visit emergency room

From the study subjects, 61(50.8%) Were forced to visit emergency due to exposure to allergen, 21(17.5%) due to severity of asthma, 13(10.8%) came due to dug compliance (poor adherence to regular treatment) and the rest 25(20.8%) had come due to other reasons like stress, exercise.

Factors that lead patients to emergency room	Frequency	Percentage (%)
Exposed to allergen	61	50.8
Severity of asthma	21	17.5
With unknown cause		
Drug compliance	13	10.8
Others (stress, exercise...)	25	20.8

Table 3 factors that lead patients to visit emergency.

When we consider the presence of comorbid disease 41(34.17%) of the study subject had problems of comorbid disease. The mentioned comorbid disease was tuberculosis, COPD, Hypertension, DM, Cardiovascular disease.

Table 4 the outcome of the patient

Outcome	frequency	Percentage (%)
Improved and discharge	116	96.7
Died	4	3.3

As we see from the table most of the patients had improved only four patients died .The death might be due to comorbidity.

Table 5. The association between sociodemographic variables and outcome of asthma.

Variable	characteristics	outcome		Odd Ratio(95%CI)		P-Value
		improved	died	COR	AOR	
AGE	<54	73 (97.3%)	2 (2.7%)	0.589 [0.080-4.334]	0.573(0.067-4.876)	0.610
	>=54*	43 (95.6%)	2 (4.4%)	1.00		
SEX	Male	53 (96.4%)	2 (3.6%)	1.189 [0.162-8.728]	0.966 (0.114-8.195)	0.975
	Female*	63 (96.9%)	2 (3.1%)	1.00		
RESIDENCY	Urban	80 (96.4%)	3 (3.6%)	1.1296 [0.130-12.899]	1.344(0.134-13.483)	0.802
	Rural*	36 (97.3 %)	1 (2.7%)	1.00		

* reference, COR=crude odd ratio, AOR=adjusted odd ratio, IC= confidence interval

Table 6 Presence of comorbid disease and the outcome of the patient in cross tabulation

Comorbidity	Outcome		Total
	improved	Died	
yes	38 (92.7%)	3 (7.3%)	41
No	78 (98.7%)	1 (1.3%)	79
Total	116	4	120

NB. (% with in the presence of comorbid disease)

This table shows that most patients died due to asthma had comorbidity.

CHAPTER SIX

DISCUSSION

SOCIO –DEMOGRAPHY

From 120 patients 55(45.8%) were male and 65(54.2%) were female giving a male to female ratio of 0.84 to 1.0. Which shows the prevalence with regard to sex is almost the same. There is a research done in Portugal which support this finding where females (57.3%) and male (42.7%) [11]. There was also a study done in Malaysia form 2007-2009 which shows it was slightly higher in females. [13]. Most of the age group are found in the age interval of 34-43(n=31), 54-63 (n=25) and 24-33(n=24), totally that account 66.6%. When this study is compared to the research done in Portugal, 62.2% between 19 and 64 years of old.[11]. There was a study conducted in black lion specialized hospital which was 79.7 % 1n this age group [25].

Since this age group is actively participating in different tasks and highly exposed to different allergens this result is expected.

PREVALENCE OF BRONCHIAL ASTHMA

The prevalence of this study was 1.5%. The World Health Organization (WHO) estimates that there are 300 million people world-wide suffering from asthma with approximately 250,000 asthma-related annual deaths. The Global Initiative for Asthma (GINA) estimates that the global prevalence of asthma ranges from 1 to 18% of the total population of different countries. Studies indicate that asthma is not just a public health problem for high-income countries but is increasingly becoming widespread in the developing world with most asthma-related deaths occurring in low and lower-middle income countries including Sub-Saharan Africa [6]

This finding is relatively low from that of a research conducted in Indian adults on prevalence and risk factors for bronchial asthma which was 2.38 and vary in different places with in the country (Chandigarh=2.28, Delhi =1.9, Kamur=2.05 and Bangalore =3.47[3]. This may due to this country may highly industalized than Addis .There was also a crosssectional study from

2007-2009 in Malaysia in orangasli area which can be agreed with this study showed that 1.2 % of prevalence in adults [13] .

The WHO estimates the prevalence as 1.5 % for Ghana compared to 0.3% for Greece and 2.8% for Wales and New Zealand [6] .This number is relatively low when compared with a study done in Uganda which shows 2.5% were diagnosed with asthma. Even though it is slightly higher from a research done in Black Lion Hospital which was 1.04 % [25] it is still low. A lower number of prevalence in this study may be due to incompleteness of Patient's chart that were excluded in the study, ZMH is a tertiary hospital and a number of patients might be treated and managed in the nearby health institution.

SYMPTOMS SEEN

From 120 patients included in the study, 90.8 %(n=109), had wheezing, 85% (n=102) had dyspnea and 80.8 %(n=97) had cough. Only 8 patients had atopic dermatitis .As we see from the result the most dominant symptoms are wheezing, dyspnea and cough. This study finding is relatively comparable with the study conducted in Black Lion Hospital (research done in 2015) the major symptom and sign seen among those diagnosed with asthma was cough (84.5%), wheezing (91.9%) or breathing trouble (88.5%.) [25].

SEVERITY OF ASTHMA

From patients included in the study (n=120), 63(52.5%) were moderate, 27(22.5%) were mild, 30 (25%) were severe. When I compare this from a research done in Brazil, from 102 patients 2.9% were mild, 30.4 % were moderate and 66.7% were sever [16]. Most of the patients from this study were sever as it is expected for specialty service in emergency. Our study is contrast to this study; the reason may be due to improper classification of asthma according to the GINA asthma classification system.

COMORBIDITY OF THE DISEASE

From the study subjects 32.5 % had comorbid disease. This is a possible reason for asthma exacerbation and come to emergency room. A study showed that asthma is often diagnosed after a long time because of the patients' low medical seeking behavior and not knowing the exact triggering factor, this may be an important factor for increasing morbidity [4].

FACTORS THAT LEAD PATIENTS TO EMERGENCY

The most frequent factor that lead patients to emergency were exposure to different allergens. And other factors were poor adherence to the drug, exercise, stress. Literatures also mentioned the same factors [10].

OUTCOME OF THE PATIENT:

From the studied subjects 96.7% (n=116) had improved and discharge to home. Only 3.3% of the studied subjects were died. The death might be due to severity of asthma and comorbid factors. The risk estimation of smoking status of the patient with the outcome can't be computed because of most of the patients smoking status is unknown.

OUTCOME AND ASSOCIATED VARIABLES

From chi-square test, sex and residence had association to outcome of asthma with p-value of 0.029 and 0.049 respectively. But in a multiple logistic regression they hadn't association with AOR of 0.966[0.114-8.195] P-Value=0.975 and AOR=1.344[0.134-13.483] respectively. But age hadn't association with outcome of asthma both in chi-square test and multiple logistic regression tests with p-value of 0.276 and 0.610 respectively. No similar studies found in literatures.

LIMITATIONS OF THE STUDY

- I. One of the major limitations of this study is inability to assess many factors like economic status of the patient and educational status with retrospective study design because these factors has a greater importance for the prevalence of asthma in different literatures.
- II. It may not be generalized beyond the study population, as it involves patients at a single center

CHAPTER 7

CONCLUSION

There was a low prevalence of bronchial asthma in emergency with no difference in sex. The mean age was 46.76. The prevalence was high in age group of 34-43 and 54-63. Since patients in this age group are active in participating in different tasks, there is an impact on the economical development and other aspects of the country. Majority of the patients with asthma were urban dwellers. Wheezing, dyspnea (breathing trouble) and Cough were the predominant symptoms and signs seen in the study. Most patients came to emergency due to exposure to different allergens. In a chi-square test sex and residence had association with outcome of asthma. Most patients classified as moderate bronchial asthma which differs from other country studies, so appropriate classification should be taken.

RECOMMENDATION

- ✓ ZMH should have guide line for classification of asthma based on severity.
- ✓ Up-to-date training should be given to ED staffs for properly classification of bronchial asthma based on severity.
- ✓ ED patients should be considered an important target for asthma education (ED staffs should teach about asthma triggering factors)
- ✓ Other researchers should study the asthma prevalence by prospective study design.
- ✓ The government should focus on the sanitation of urban environment to minimize asthma prevalence urban setting.

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Annexes

Annex I. Check list

I am Sisay Fentahn 2nd year MSc student of EM&CCN at AAU.

This checklist is prepared to collect data from ZMH on asthma in emergency for partial fulfillment of MSc in AAU in emergency medicine & critical care nursing.

SOCIO DEMOGRAPHIC DATA

1. Patient card number-----
2. Age of a patient in years-----
3. Sex of a patient A. Male B. Female
4. Ethnicity A. Amhara B. Oromya C. Tigray D. SNNPR.
5. Religion A. Orthodox B. Islam C. Protestant D. Others
6. Marital status A. Single B. Married C. Divorced D. Widowed
7. Occupation
A. Farmer B. Trader C. Government employer D. self-employee
8. Residency A. urban B. rural
9. Smoking status A. smoker B. non-smoker C. unknown

SYMPTOMS SEEN

- | | | |
|-----------------------------------|--------|-------|
| 9. Wheezing | A. YES | B. NO |
| 10. COUGH | A. YES | B. NO |
| 11. Dyspnea (shortness of breath) | A. YES | B. NO |
| 12. Limits daily activity | A. YES | B. NO |
| 13. Rhinitis | A. YES | B. NO |
| 14. Sinusitis | A. YES | B. NO |
| 15. Atopic dermatitis | A. YES | B. NO |
| 16. Altered mental status | A. yes | B. NO |
| 17. Cyanosis | A. yes | B. NO |

SEVERITY OF ASTHMA

A. **mild**(not use of accessory muscles, speak sentences, respiratory rate 12-20,heart rate 60-100,spo₂≥95%)

B. **Moderate** (use of accessory muscles, speak in phrases, agitated, respiratory rate 20-30, pulse rate 100-120, and spo₂=90-95%

C. **Sever** (speak in words, decreased mental status, use of accessory muscles, respiratory rate >30, pulse rate >120 and spo₂ <90.

PRESENCE OF COMORBID DISEASE (hypertension, diabetic mellitus tuberculosis, obesity, depression, anxiety.....)

A. Yes B. No

5. out come? A. improved B. died

6. Factors that lead patients to visit ER of ZMH-----

Annex II –Declaration

The researcher, undersigned, declare that this is my original work and has not been presented in this or any other university and all sources of materials used for this proposal have been fully acknowledged.

Name: Sisay Fentahun

Signature-----

Date-----

Place: Addis Ababa University, school of health science, Department of emergency medicine.

This proposal will be submitted for examination with my approval as the university advisors.

Advisors

1 .Dr. Aklilu Azazh (MD, Associated professor)

Signature-----

Date-----

2 .Mr. Kibatu Gebre (MSc, AAU lecturer)

Signature-----

Date-----

Place: Addis Ababa University College of Health Sciences