

## Evaluation of Asthma Management Outcomes

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| Received: 17.06.2022 | Accepted: 21.07.2022 | Published: 30.07.2022

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### Abstract

### Original Research Article

**Background:** Asthma is a serious global health problem with an estimated 300 million affected individuals. Clinical manifestations of asthma can be controlled with appropriate treatment. When asthma is controlled, severe exacerbations should be rare. The goal of treatment in Asthma is to reduce inflammation and to achieve total control. Treatment with anti-inflammatory drugs can, to a large extent, reverse some of these processes; however, the successful response to therapy often requires weeks to achieve and, in some situations, may be incomplete. **Objectives of the study:** This study was performed to evaluate the outcomes of Asthma treatment amongst asthmatic patients on follow-up at King Hussein Medical Centre (KHMC) at the Royal Medical Services (RMS) in Jordan/Amman. **Methods:** A retrospective, observational study was designed and performed on the basis of the asthma patient medical files. The patients' medical profiles were revised and the results were assessed according to global initiative for asthma (GINA) guidelines. The collected data was analyzed by using statistical Package for the Social Sciences (SPSS) version 22. **Results:** A total of 210 asthmatic patient's profiles were revised, and amongst the patient's majority (62.6%) were males and the average age of the participants was 35.1 years with standard deviation (SD) of 9.4. The most (53.3%) have been prescribed asthmatic drug combination of fluticasone propionate and salmeterol xinafoate (Seretide<sup>®</sup>) for long term asthmatic symptoms management. Amongst the asthmatic patients, 58 % had used antibacterial for their respiratory tract infections (RTIs) and urinary tract infections (UTIs). **Conclusion:** This study has shown that, despite the existence of an effective medication for asthma, disease control is insufficient and falls short of the accepted global guidelines.

**Keywords:** Bronchial Asthma, Outcomes, Control, Infections, Inhalation.

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## INTRODUCTION

Chronic respiratory diseases are amongst the principal reasons of mortality and morbidity globally. Bronchial Asthma (BA) is the furthestmost widespread chronic respiratory disease among the globe, disturbing more than 340 million individuals of through all age groups with various ethnicities [1]. In spite of optimum guideline-directed management, and regardless of disease severity, asthmatic individuals are usually suffering from acute exacerbations, which are produced by an enhancement of present inflammatory processes and a lack of illness management. The "Global Initiative for Asthma" (GINA) has introduced efficient guidelines for the diagnosis and management of BA in children and adults yearly for over 12 years. BA is "defined as a chronic inflammatory disorder of the airways in which many cells and cellular elements play a role". BA includes multipart relations of "airflow obstruction", "bronchial hyper-responsiveness" and a "primary inflammation" [2]. BA represents itself as

frequent incidents of "wheezing", "breathing difficulty", "chest tightness" and "recurrent cough". BA often occurs in individuals sensitized to domestic allergens (e.g., domesticated animal), one of the atypical BA is occupational BA is due to agriculture, painting, housework, and plastic industry. In most developed countries approximately 30% of adults with BA are tobacco users. BA and tobacco smoking interrelate to be a reason for more complicated symptoms, faster deterioration in lung capacity, and reduced short-term pharmacological reaction to steroids. Tobacco smoking drops steroids response in individuals with BA and deteriorates their symptoms and exacerbation incidence [3]. Inhaled corticosteroids (ICS) are the basis of BA management. Nevertheless, the ideal treatments for smokers with BA are not well cleared since smokers are typically omitted from clinical studies. Main categories of drugs in BA treatment consist of "bronchodilators  $\beta_2$ -agonists", "anti-inflammatory inhaled corticosteroids",

“leukotriene modifiers” and “Theophyllines”. For the reason of the intrinsic inconsistency in responses to treatment, several individuals continue to be symptomatic in spite of good adherence to BA education and prevention program strategies [4]. In individuals with BA, it is permanently supportive to quantitatively outline the grade of airway obstruction. This is best performed with a spirometer. A diversity of methods is accessible that routinely address the most vital dimensions made through a forced expiratory blow, including the “forced expiratory volume in 1 second (FEV<sub>1</sub>)”, “the forced expiratory vital capacity (FVC)”, “the ratio of FEV<sub>1</sub> divided by FVC (FEV<sub>1</sub>/FVC ratio)”, and “the forced expiratory flow rate (FEF)”. The guidelines suggest that each individual with BA should be capable to identify symptoms that propose insufficient BA control [5]. By way of BA severity, evaluation of control is conducted by existing decline in lung function and upcoming threat. The clinical presentation used to define existing decline is similar as those used to define decline in estimating BA severity, specifically daytime symptoms, nighttime wakening, recurrent usage of SABs, and incapability to perform usual tasks [6].

This study was conducted to assess the outcomes of Asthma treatment among the adult patients on follow-up at King Hussein Medical Centre (KHMC) at the Royal Medical Services (RMS) in Jordan/Amman.

## METHODS AND MATERIALS

### Study design and population

Based on the medical profiles of the asthmatic patients from 1 February 2017 to 1 February 2019, the study was carried out at King Hussein Medical Center at the Royal Medical Services (RMS) in Jordan/Amman. For this study, 210 asthmatic patients who also had BA were randomly selected, and their medical records were examined. Patients with BA at the

selected center were included in the study if they were patients of age 18 years and above, with a confirmed diagnosis of BA with or without other comorbidities, have been prescribed BA medications. Patients with incomplete asthmatic patient profile forms (medical records) and those who had started medication less than a month prior were excluded from the trial. Data was gathered through gaining access to the Hakeem database. The medical outpatient profiles of all chosen BA patients were examined, and the outcomes were assessed in accordance with GINA standards.

## RESULTS

The majority (71%) of the 210 subjects in the study sample were male BA patients, while only 29% were female. The mean age of the participants was 38 years, with a standard deviation (SD) of 10.1, and a majority of participants (67%) were between 57 and 69 years. This result showed that the study sample's majority of participants was elderly. The majority of research participants 177 (84.2%) were married, while the remainder 33 were either single, divorced, or widowed (15.8 %).

### Clinical characteristics of asthmatic patients

Throughout the time of the research, 61% of participants were having BA exacerbation, while 39% didn't suffer from any exacerbation. Only 31% of participants were admitted to the hospital at least once in their follow up owing to BA complications, the majority (69%) patients were admitted to the hospital for other medical complaints rather than BA related complications. As illustrated in Tables 1 and 2 below, SOB is the furthestmost BA symptoms demonstrated by the studied BA patients thru their clinic appointments. Wheezing was the most manifested symptom thru the first appointment (85.7%). Chest tightness is the lowermost BA symptom demonstrated from the second clinic appointment.

**Table 1: Symptoms that manifested among BA patients**

Asthma symptom	1st visit	2nd visit	3rd visit	4th visit	5th visit
Symptom free	31 (14.7)	66 (31.4)	110 (52.3)	111 (52.8)	141 (67.1)
Wheezing	180 (85.7)	45 (21.4)	16 (7.6)	21 (10)	22 (10.4)
Cough	155 (73)	115 (54.76)	71 (33.8)	70 (33.3)	45 (21.4)
SOB	178 (84.7)	125 (59.5)	66 (31.4)	41 (19.5)	54 (25.7)
Chest tightness	71 (33.8)	26 (12.3)	20 (9.5)	19 (9)	6 (2.85)

**Table 2: Drugs Used for the Management of BA among the Study Sample**

Current Asthmatic drugs	Frequency (%)
fluticasone propionate and salmeterol xinafoate (Seretide®)	112 (53.3)
Budesonide and formoterol fumarate dehydrate (Symbicort®)	58 (27.6)
SABA and Beclomethasone Inhaler	28 (13.3)
SABA and Beclomethasone Inhaler and oral Prednisolone	12 (5.7)
Total	210

**Table 3: Non-Asthmatic Medication Prescribed among Study Sample**

Current non-Asthmatic Drugs	Frequency (%)
Anti-Bacterial Drugs	122 (58)
Cardiovascular Drugs	101 (48)
Gastrointestinal Drugs	77 (36.6)
Non-steroidal anti-inflammatory drugs (NSAIDs)	59 (28)
Gynecological and Dermatological drugs	44 (20)
Anti- Allergy Drugs	32 (15.2)
CNS and Psychiatry drugs	18 (8.5)
Endocrine drugs	17 (8)

**Drugs Used by the study population**

The most used anti-asthmatic drugs among the total study sample, 53 (53.3%) was the combination of fluticasone propionate and salmeterol xinafoate (Seretide®). The second most used combination therapy was Budesonide and formoterol fumarate dihydrate (Symbicort®) 58 (27.6%). No drug was used alone as a monotherapy. Of the total concurrent medication used by the study sample, it can be seen in Table 3 that anti-bacterial account 58%. Following anti-bacterials, the most used drugs were cardiovascular medications including antidiabetic drugs (48%). Medication for GIT, including H2receptor blockers (Famotidine), Proton pump inhibitors (Omeprazole, Esomeprazole) and

antacids accounts 36.6%. Other drugs for different diseases are illustrated in Table 3.

**Association between treatment outcome and selected factors**

Of the 210 asthmatic individuals that were studied, 56.2% had their asthma poorly controlled, compared to 43.8% of the others. Among the asthmatic patients shown in Table 4, there is a significant correlation between occupational status and asthma exacerbation (p-value =0.05). In contrast to the significant link between treatment outcome and patient occupation (p>0.05), there is no correlation between treatment outcome and asthmatic patients' gender, age, or occupation (p<0.05).

**Table 4: Association between Asthma Exacerbation and Socio-demographic Characteristics among Study Sample**

Characteristic	Asthma exacerbation				p-value
	Status	Yes	No	Total	
Gender	Male	78	71	149	>0.05
	Female	33	28	61	
Age (years)	18-24	5	3	8	>0.05
	25-34	5	7	12	
	35-44	14	10	24	
	45-54	10	16	26	
	55-64	35	53	88	
	>64 years	25	27	52	
Occupational status	Farmer	6	9	16	<0.05
	Student	3	4	7	
	Housewife	6	4	10	
	Employed	24	22	50	
	Tradesman	22	13	35	
	Retired	45	51	96	

**DISCUSSION**

Majority of the patients diagnosed with BA were in the 55-64 age groups and male to female ratio was 2.5:1. In the current study, 61% of the enrolled patients in the study suffered from asthma exacerbation with lower and upper respiratory tract infection. This is consistent with a study performed in the USA which revealed that 53% of the patients with acute asthma were managed with an antibacterial [7]. This proposes that the most precipitating diseases are infection associated. This might be because of only inadequate patients who proved to have bacterial LRTI were administered anti-bacterials as majority cases of LRTI are viral origin [8]. The current guidelines recommends

that monotherapy with SABA on an as-needed basis is no longer recommended as the primary management for mild asthma since it leads to increase the opportunity of exacerbations incidence. To lower opportunity of these exacerbations, adult asthmatic patients should be prescribed a combination therapy with an inhaled corticosteroids (ICS) and a long-acting bronchodilator (LABA) on an as-needed route for mild asthma or daily inhalation for moderate or severe asthma. The available treatment options in the RMS are fluticasone propionate and salmeterol xinafoate (Seretide®) or budesonide and formoterol fumarate dihydrate (Symbicort®) as an alternative. If a SABA is to be prescribed, it should be concurrently combined with a low-dose ICS [9]. These

recommendations were applied among asthmatic patients in our study.

In the current study, 58% of asthmatic patients in the study sample were given anti-bacterial for treatment of URTI and LRTI. Throughout the previous 5 years, numerous studies have been performed for the aim of anti-bacterial role of macrolides in managing asthmatic patients and the anti-inflammatory properties of macrolides [10-15]. *M. pneumoniae* and *C. pneumoniae* infection were found to be a vital contributor to asthma clinical manifestations. The current study has confirmed that in spite of the accessibility of efficient treatment options for asthma, the management of asthma symptoms including exacerbations is sub-optimal according to the GINA guideline recommendations. The results of the current study showed that 61% of the patients had suffered from exacerbations which reflects poor asthma control. The results of this study are consistent with an earlier study performed in Jordan with the aim of investigation of the level of asthma control, its correlation with quality of life, and possible predictors of asthma control [16]. The study found that most of the recruited patients (69.4) have not achieved optimal asthma control and was associated with low quality of life. In the current study, regarding the demographic variables, it was found that gender and age have no correlation with treatment outcome, but there is an association between occupation and treatment outcome (p-value <0.05).

## CONCLUSION AND RECOMMENDATION

Poor asthma control in Jordan is related with acute asthma exacerbations and the need to step-up treatment. Asthma control still unacceptable in Jordan. This can be managed by improving access to proper treatments, reassuring better medication compliance and smoking cessation, In addition to more practical follow-up and improved education amongst medical teams and asthmatic patients.

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