**Application of Asthma Control Test in Patient with Asthma**

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**Abstract**

BACKGROUND: Bronchial asthma is a chronic inflammatory syndrome that is highly prevalent worldwide, affecting approximately 300 million individuals of all ages

OBJECTIVE: to assess Asthma control test in patients with asthma and its association with some individual characteristics, medical history and type of treatments .

METHODS: This was a descriptive observational study involving 80 outpatients with asthma under treatment at the Asthma Outpatient Clinic of the Merjan teaching hospital in Al-Hilla city , Babylon ,Iraq. The patients were evaluated regarding sociodemographic and clinical characteristics, as well as anthropometric measurements. The asthma control status was assessed using the asthma control test (ACT).

RESULTS: The overall mean of age of asthmatic patients was (36.58 ± 9.549 years), for BMI was (27.85± 5.87 kg/ m2) and for ACT( 16.912±5.0295). Out of (80) asthmatic patients 58(72.5%) had poor asthma control ( ACT< 20) compare to 22(27.5%) with well asthma control. There were significant association between ACT score wither poor control (ACT<20) or well control (ACT=20-25) with residence , BMI and with waist/ hip ratio risk levels and no significant difference between two group regarding age groups, sex, occupation and marital state categories (p-value= 0.990, 0.539,0.181and 0.128) respectively

There was significant association between asthma control with onset age of asthma(χ2=13.315, df=2.p-value=0.001) duration of asthma (p-value=0.002), history of visit emergency room in past year due to asthma (p-value=0.02) were majority of poor asthma control (86.2%) reported such history, type of treatment (p-value=0.000) , majority of well asthma control group (45.5%) use Ratio ICS/LABA compared with (8.5%) of poor asthma control meanwhile, (46.5%) of the last group use ICS compared to (9%) in well control group use ICS. and no significant association of family history of asthma , history of hospitalization in past one year between two groups (p-value= 0.990,0.624) respectively.

CONCLUSIONS :this study represent unacceptable high level of asthmatic patient with poor asthma control , with the vast majority of patients not received appropriate diagnosis , treatment and failing to achieve the goals of control set.

**Keywords:** Asthma; asthma control test

**الخلاصة**

مقدمة : البو القصبي مرض مزمن واسع الانتشار عالميا , يصيب حوالي 300 مليون شخص سنويا ومن كافة الاعمار

الهدف من الدراسة: لقياس اختبار السيطرة على الربو القصبي لدى المرضى المصابين بالربو وعلاقتة ببعض العوامل الشخصية و التاريخ المرضي و نوعية العلاج

طريقة البحث : دراسة مستقطعة شملت (80) شخص مصاب بالربو القصبي وتحت العلاج في مستشفى مرحان التعليمي في مدينة الحلة محافظة بابل ,العراق.شملت الدراسة اجراء استبيان شمل العوامل الديمغرافية و الصفات السريرية للمرضى وبعض القياسات الجسدية من الوزن و الطول ومؤشر كتلة الجسم وتم اجراء تقييم السيطرة على الربو باستعمال اختبار السيطرة على الربو القصبي .

النتائج: وجدت الدراسة ان معدل الاعمار لمرضى الربو القصبي كان (36.58 ± 9.549 سنة ) وان مؤشر كتلة الجسم (27.85± 5.87 kg/ m2) ومعدل نتائج اختبار السيطرة على الربو كان( 16.912±5.0295) .

من مجموع العينة البالغ (80) شخص وجد 58(72.5%) لديهم سيطرة سيئة للربو القصبي حيث كان المؤشر لديهم اقل من 20 مقارنة مع 22(27.5%) لديهم سيطرة جيدة للربو . ووجد فرق معنوي بين مؤشر نتائج اختبار السيطرة على الربو مع مكان السكن و مؤشر كتلة الجسم ومؤشر النسبة بين محيط البطن و الحوض وعدم وجود اي اختلاف معنوي بين المجموعو المسيطرة للربو و المجموعة غير المسيطرة بالنسبة للعمر والجنس و المهنة و الحالة الزوجية للمرضى بمؤشر معنوي (p-value= 0.990, 0.539,0.181and 0.128) بالتناوب . ووجد اختلاف معنوي بين المجموعتين المسيطرة على الربو القصبي و الغير مسيطرة على الربو القصبي بالنسبة للعمر الذي بدا فية الربو القصبي(χ2=13.315, df=2.p-value=0.001) ومدة الاصابة بالربو (p-value=0.002) ومعدل دخول ردهة الطوارئ في السنة الاخيرة بسبب الربو القصبي (p-value=0.02) والذي سجل غالبية المرضى غير المسيطرين على الربو دخول ردهة الطوارئ. - وسجل الفرق المعنوي بين المجموعتين باختلاف نوع العلاج المستعمل ( p-value=0.000) , حيث سجل ( (45.5% من المجموعة المسيطرة على الربو استعمال العلاج ( (Ratio ICS/LABAمقارنة بالمجموعة غير المسيطرة ((8.5%

والتي سجلت الاخيرة (46.5%) استعمال نوع العلاج ICS مقارنة مع (9%) من المجموعة المسيطرة على الربو.ولم تجد الدراسة اي اختلاف معنوي بين المجموعتين بالسيطرة على الربو بما يخص التاريخ العائلي للربو القصبي وتاريخ الرقود بالمستشفى في السنة الاخيرة ( (p-value= 0.990,0.624بالتناوب.

الاستنتاجات: اظهرت الدراسة معدل غير مقبول من عدم السيطرة على الربو القصبي لدى المرضى المصابين بة وان غالبية المرضى لا يحصلون على وسائل مناسبة للتشخيص و العلاج وفشلوا بالوصول الى معدل السيطرة على الربو .

**الكلمات المفتاحية :** الربو القصبي , اختبار السيطرة على الربو

**Introduction**

Bronchial asthma is a chronic inflammatory disease of lower airways, clinically characterized by attacks of breathlessness (dyspnea) with wheezing and chest tightness due to reversible airways obstruction .Heterogeneous etiology of bronchial asthma makes it impossible to provide a precise, uniform classification of the disease. Traditionally, asthma has been categorized as either atopic(extrinsic) or non-atopic(intrinsic). Atopic asthma is associated with environmental antigens and specific immunoglobulin E antibodies (IgE), whereas non-atopic form is associated with no identifiable environmental factor or increased concentration of IgE antibodies(Jeffery &,Turato ,2003) . Asthma is thought to be caused by a combination of genetic and environmental factors Its diagnosis is usually based on the pattern of symptoms, response to therapy over time, and spirometry. It is clinically classified according to the frequency of symptoms, forced expiratory volume in one second (FEV1), and peak expiratory flow rate. (Martinez ,2007; Lemanske & Busse ,2010 ;Yawn , 2008; Robbins *et al*,2010)

 As of 2011, 235–300 million people worldwide are affected by asthma and approximately 250,000 people die per year from the disease .Rates vary between countries with prevalence between 1 and 18%.It is more common in developed than developing countries.(WHO fact sheet,2011) , (Opolski &Wilson, 2005) Asthma is a common condition which produces a significant workload for general practice hospital outpatient clinics and inpatient admissions. It is clear that much of this morbidity relates to poor management particularly the under use of preventative medicine. (British Guideline on the Management of Asthma,2003), (Scottish Intercollegiate Guideline,2008)

Asthma associated with many complications include Symptoms that interfere with sleep,work or recreational activities , sick days from work or school during asthma flare-ups, permanent narrowing of the bronchial tubes (airway remodeling) that affects how well the person can breathe ,emergency room visits and hospitalizations for severe asthma attacks and Side effects from long-term use of some medications used to stabilize severe asthma, (McPhee,2012)

The concept of asthma control includes clinical and functional manifestations, such as symptoms, nocturnal awakenings, use of rescue medication, activity limitation, and pulmonary function. The risk of future disease- and treatment-related complications, including exacerbations, accelerated decline in pulmonary function, and adverse effects of drugs, should also be considered. Asthma education and careful pharmacological management are essential interventions for disease control. Uncontrolled asthma can result in limitations of activities of daily living and even death. (Global Initiative for Asthma,2009), (Bateman *et al.,*2004)

Despite a worldwide consensus on the goals of asthma management, recently published epidemiological data from Europe , the United States and elsewhere indicated that , in many countries , the treatment of patient with asthma is currently inadequate. (Rabe & Adachi,2004)

The asthma control test (ACT) questionnaire was developed with the objective of estimating the degree of asthma control. This tool provides information on the multidimensional nature of the disease. ( Nathan & Sorkness,2004)

Asthma control test (ACT) is a quick test that provides a numerical score to assess asthma control, it's recognized by the National Institutes of Health (NIH) in its 2007 asthma guidelines. It's clinically validated against spirometry and specialist assessment. (Guidelines for the Diagnosis and Management of Asthma,2007) . The ACT was developed to assess asthma control, and it has shown strong evaluative and discriminative properties.( Nathan & Sorkness, 2004)

It consists of five questions, related to the four weeks preceding the evaluation, addressing multiple dimensions of control, including episodes of breathlessness, nocturnal awakenings, limitations in activities of daily living, self-rating of asthma control, and need for rescue medication. Score: 25(indicated under control over the last 4 week) , Score: 20 to 24 (on target, asthma reasonably well controlled during the past 4 weeks) , Score: less than 20(off target , not have been controlled during the past 4 weeks)

Asthma can result in physical, emotional, and social limitations for patients. These limitations can impair patient quality of life. In general, the quality-of-life impairment in asthma patients is proportional to the degree of disease activity.( Adams & Wakefield,2001) (Juniper EF,2005)

Proper treatment makes a big difference in preventing both short-term and long-term complications caused by asthma and better quality of life

The aim of this study : to assess Asthma control test in patients with asthma and its association with some individual characteristics , medical history and type of treatments,

***Subjects and methods****:*

a cross-sectional study of convenient sample of the Asthmatic patients, in Merjan teaching hospital in Babylon governorate , Hilla city ,Iraq, from October -2012 to May- 2013 for outpatients asthmatic patients, who had been diagnosed with asthma accordance with the Global Initiative for Asthma criteria,( Global Initiative for Asthma 2009) and had been under outpatient treatment for more than six months, (n=80) were eligible to complete the ACT and only patients unable to fill the questionnaire were excluded. data collection Consent form after a simple description of the study to all the persons included in the study, and other variables related to socio demographic factors for study group ( age ,residence , occupation , Marital state , educational level) , as well as data regarding medical history (duration and onset of asthma and family history of asthma , history of use health services in the past year include hospitalization , and history of visit emergency unit , type of treatments ,presence of comorbidities (diabetes, systemic arterial hypertension, allergic rhinitis, and gastro esophageal reflux [GER]) were collected through a questionnaire .The anthropometric measurements were also tacked (weight, height, BMI, waist circumference(WC), waist to hip ratio(WHR)) The asthma control status was assessed using the asthma control test (ACT).

Patients were assessed for rhinitis and GER on the basis of clinical criteria. Cases of allergic rhinitis were defined as those in which patients had recurrent episodes of wheezing, rhinorrhea, pruritus, and nasal congestion that were triggered by respiratory irritants, and cases of GER were defined as those in which patients had had more than two episodes of heartburn per week for more than four weeks. The ACT was developed to assess asthma control. It consists of five questions, related to the four weeks preceding the evaluation, addressing multiple dimensions of control, including episodes of breathlessness, nocturnal awakenings, limitations in activities of daily living, self-rating of asthma control, and need for rescue medication. The total score ranges from 5 to 25 points. A score > 20 on the ACT is indicative of controlled asthma. All the patients did the Spirometry to confirm the diagnosis .

**Result**

This study has been done at the outpatient unit for asthmatic patients in Babylon province. in Merjan teaching hospital .The overall mean age of asthmatic patients was (36.58 ± 9.549 years), majority (42.0%) of them were aged between 18-40 years , (52.5%) live in urban area. Table (1)shows the distribution of asthmatic patients by socio-demographic and majority (67.5. %) of the asthmatic patients were females. (50%) of the asthmatic patients were employed and other (50%) were unemployed at time of study but reported past history of absence from work due to asthma were (68.8%) of study population reported history of absence from their work .and 32.5 of participant in this study were married compare with (67.5%) were widow or single or divorce.

**Anthropometric Measures of Asthmatic Patients:** Table 2 shows the distribution of asthmatic patients by anthropometric measures. The overall BMI was 27.85± 5.87 kg/ m2, only (27.5%) of the asthmatic patients were obese. Majority (51.3%) of the asthmatic patients were highly risk for their waist/ hip ratio

**Medical History of Asthmatic Patients:**

Table 3 shows the distribution of asthmatic patients by medical history. Majority (63.8%) of asthmatic patients had family history of asthma, (42.5%) of asthmatic patients had asthma from 10 years ago, meanwhile, (66%) of asthmatic patients developed asthma when they aged more than 20 years. (85%)of asthmatic patients had no history of hospitalization in past year due to asthma meanwhile,(68.8%) reported history of visit emergency in past year due to asthma . Regarding Current use of medication in past 4 weeks they reported ( 36.3,25,20 and 18.8 %) history of use of ICS ,Use of quick relief treatment ,Ratio ICS/SABA and Ratio ICS/LABA respectively and (50%) reported formal smoking status and (71.3%) had history of chronic disease(diabetes, systemic arterial hypertension, allergic rhinitis,GER)..

Out of (80) asthmatic patients 58(72.5%) had poor asthma control ( ACT< 20) compare to 22(27.5%) with (mean ACT= 16.912±5.0295)

**Association of Asthma control test score with Socio-Demographic Characteristics**

Table 4 shows the associations of asthma control test score with patient’s socio-demographic characteristics. There were significant association between ACT score wither poor control (ACT<20) or well control (ACT=20-25) with residence (χ2=5.205, df=1.p-value=0.023) and no significant difference between two group regarding age groups, sex, occupation and marital state categories (p-value= 0.990, 0.539, 0.181and 0.128) respectively.

**Association of Asthma control test score with Anthropometric Measures**

Table 6 shows the association of Asthma control test score with patient’s anthropometric measures. There was significant association between asthma control groups with BMI groups(χ2=19.684, df=3.p-value=0.000) with (13.7%) of poor control asthma were normal weight compare with (50%) of well asthma control group as well as with waist/ hip ratio risk levels. Only (34.5%) of patients with poor asthma control were obese compare with (9.1%) of well asthma control , meanwhile, majority (56.8%) of patients with poor asthma control were at high risk level of waist/ hip ratio with significant difference between study groups regarding high risk level of waist/ hip ratio(χ2=6.781, df=2.p-value=0.03)

**Association of Asthma control test score with Medical History**

Table 6 shows the association of Asthma control test score with patient’s medical history. There was significant association between asthma control with onset age of asthma(χ2=13.315, df=2.p-value=0.001) lung function test , duration of asthma (p-value=0.002), history of visit emergency room in past year due to asthma (p-value=0.02) were majority of poor asthma control (86.2%) reported such history, type of treatments (p-value=0.000) , majority of well asthma control group (45.5%) use Ratio ICS/LABA compared with (8.5%) of poor asthma control meanwhile, (46.5%) of the last group use ICS compared to (9%) in well control group use ICS. Table 6 shows no significant association of family history of asthma , history of hospitalization in past one year between two groups (p-value= 0.990,0.624) respectively.

**Discussion**

Data on the burden of asthma and asthma control in Iraq and in Babylon governorate are scarce as well as in Gulf and Near East . Despite a world wide consensus on the goal of asthma management, recently published epidemiological data from Europe , the United States and elsewere indicate that , in many countries , the treatement of patient with asthma is utterly inadequate (Rabe *et al,* 2004)

Asthma is a common condition which produces a significant workload for general practice

hospital outpatient clinics and inpatient admissions. It is clear that much of this morbidity relates to poor management particularly the under use of preventative medicine (British Guideline on the Management of Asthma,2003)

This study carried out y on (80) asthmatic patient and the result indicated that mean age distribution is(36.58 ± 9.549 years), the Majority of the asthmatic patients were female (67.5. %) while males (32.5%) different study show that the relationship of sex to asthma prevalence related to health care, and medications in a large managed care organization. (Michael Schatz,2011),

Male sex is a risk factor for asthma in pre-pubertal children. Female sex is a risk factor for the

persistence of asthma in the transition from childhood to adulthood (Aberg,1990), Toelle BG,2004) Boys with asthma are more likely to “grow out” of their asthma during adolescence than girls (Castro-Rodriguez, 2000).

Asthma epidemiology and disease expression related to Sex differences in asthma. Some Studies show an increased incidence of asthma in women. Data demonstrate that asthmatic women have increased utilization of healthcare compared to their male counterparts despite similar medical treatment and baseline pulmonary function. Research continues to explore hypotheses for these differences including the potential influences of the female sex hormones, altered perception of airflow obstruction, increased bronchial hyper-responsiveness, and medication compliance and technique (Jessica & John ; 2011).

The age is very important in the out com in asthmathis study reported the high prevalence in the study participant (42%) were at age group(18-40yrs) with no significant difference regarding age group poor and well asthma control groups(p-value=0.990) other study explain that the outcome is deteriorating progressively with age, with the highest mean scores for the fourth and fifth age groups(Koukouli, 2005)

Regarding asthma and residents in this study(52.5%)of asthmatic patients live in urban area , this may be explain due to exposure to outdoor air pollutants , poor housing quality and disproportionate environmental pollution burdens regularly found in low-income , with significant difference regarding asthma control between the study groups (p-value=0.023) with (60.3%) of poor asthma control lived in urban area compared with (31.8%) in well asthma control .Other condition that make patients who lived in urban and rural area are, such as persistent poverty, residential segregation, psychosocial stress, unemployment, lack of affordable food stores, unsafe recreation spaces, high crime rates, biased policing, concentrated environmental hazards, and social networks, are important for understanding population distributions of disease and wellbeing. However, with a few exceptions, the relationships between the physical characteristics of urban neighbor- hoods and asthma have rarely been studied (Jason Corburn,2004).This finding may be in contrast with other study that reported under diagnosis and under treatment of asthma might be more prevalent in rural area, where fewer health care resources tend to be allocated (Wong &Chow, 2008)

Approximately 10 to 15% of the adults affected by the disease report an aggravation of their symptoms while at work and an improvement (Ameille ,2003) this may explained that (50%) of the participants were unemployment and (68.8%) reported absence from work in the past year with no significant difference between 2groups regarding employment and absence from work(p-value= 0.18,0.2 respectively)may be because both group are asthmatics , (72.4%) of poor control asthma reported history of absence from work , that may be a cause of be then unemployment (53.4%)

(67.5%) of the participant asthmatic patient were Widow ,single ,divosed compared to (32.5) were married with no significant difference regarding asthma control between study groups (p-value=0.128) . Since majority of asthmatic patients in this study were female and asthma is not just a big strain on a woman's health and finances, but also a major social handicap to bring a child into the world to go through life with the physical and psychological challenges because of asthma. There are many stresses and strains on a marriage without the problems of dealing with asthmatic children. women, because of their physiology, are more at a disadvantageous position than men. "monthly hormonal changes, pregnancy and lactation are all special challenges. in fact, several patients develop asthma because of pregnancy. but because of poor awareness, their condition remains untreated.

Some asthmatic patients did not get help from their husbands in coping with their ailment in our community, or may be suffer the additional wrath of their spouses when they had an attack. Or may be due to patients had marital problems which could be attributed to their physical condition , depression because they have asthma. families members had withdrawn from social functions because of the embarrassment of an asthmatic in their midst, whose attack could be triggered off any time.

The subject of depression caused by asthma is a big one, which has a powerful effect on social life. Some people have such bad asthma that their marriage prospects, or family life are badly affected. Asthma in a child may keep not only the child but both parents awake, so that they have to get through the day and through work although deprived of sleep, and anxious about their child.

Other stresses add to this. There may be a bereavement, fear of job loss, stress at work, or marital strife. The whole situation can become too difficult to handle without help and sympathy ,in addition asthma can interfere with normal sexual relations. Naturally, people become very upset by this. The exact cause and effect relationship between asthma and obesity is complex and not fully understood (Litonjua & Gold ,2008) Several studies have suggested that people who are obese are at increased risk of developing asthma in adulthood.24-27.this study reported ( 68.8%) of asthmatic patients were overweight and obese (Sid ,2008)( Camargo,1999), (Ford& Mannino,2004)( Rönmark & Andersson ,2005)

Weight loss in overweight and obese people with asthma has been shown to reduce asthma symptoms, the need for medication, and improve airflow.24, 34 Although it is not clear whether obesity is a primary risk factor for the development of asthma or simply exacerbates existing asthma, it has been shown to be an important source of respiratory morbidity(Ford & Mannino, 2004)

Recently, two observational studies showed that abdominal obesity, assessed by waist circumference were about 51% had high health risk by waist to hip ratio, was independently associated with increased prevalence and incidence of asthma. obesity contributes to asthma development and become complicated and there is no single mechanism that supports this association. However, in the literature, several mechanisms have been implicated (shore,2008). First, asthma in obesity is associated with increased adipokines, such as leptin, in visceral adipose tissue. Leptin and other adipokines may have direct effects on the airway rather than enhancing airway inflammation to induce asthma in obesity.

Secondly, mechanical factors might be responsible. Obese patients breathe at a lower than normal functional residual capacity which is associated with the risk of both expiratory flow limitation and airway closure and airway hyper responsiveness. Thus obesity has effects on lung function that can reduce respiratory well-being, even in the absence of specific respiratory disease, and may also exaggerate the effects of existing airway disease (shore SA ,2008) with a significant difference between the two study groups regarding BMI (p-value=0.000) and increase prevalence of overweight in poor asthma control (48.4%) and (34.5%) were obese compared with (22.7%,9.1%) in well asthma control respectively. and significant difference regarding waist to hip ratio with about 56% and 36% in poor and well asthma control respectively . There is conflicting evidence about whether or not obesity increases asthma severity in either adults or children (Thomson & Clark,2003) (Varraso, 2005) (Lavoie,2006) However, there is evidence that both children and adults with asthma who are overweight or obese tend to utilize more health care services(Sid & Sutherland, 2008) (Mosen *et al.,* 2008) use more asthma medications,24, 30 and experience an increase in symptoms( Sid DD, Sutherland ER ,2008) poorer control (Laforest *et al.,*2006), (Mosen DM,etal,2008) and lower quality of life compared with those who are not overweight or obese (Sid & Sutherland,2008) ) (Mosen *et al.,*2008) (Carroll *et al.,* 2006)

 In the present study, we found that the patients (48.3%) with longer duration of disease >10 years had poor asthma control. And majority (54.5%) of well control asthma had duration less than 5 years with significant difference between 2 groups regarding duration of asthma (p-value=0.002) A likely explanation for that finding are not only the under-recognition of uncontrolled asthma , the underuse of appropriate controlled treatment and inadequate patient education and lung function monitoring in the past years because of the war in Iraq , and many years of blockade.

also in our study indicate there is strong association between control of asthma and age onset of asthma this is agree with other study done to Japanese adults when The severity of asthma rose with increasing age at onset, and vice-versa.. Asthma duration, total serum IgE level, smoking status, and age at onset were strongly associated with asthma severity. Age at onset was independently associated with the severity of adult-onset asthma ( Tsukioka *et al.,* 2010).

Other study consisted of male patients with a mean age of asthma onset of 46 years. (Polosa R,2008 ) also in this table there is a relation between asthma and age of onset and this relation explained by many study one of them indicate that asthma is a heterogeneous disorder, in which age of onset seems to play an important role (Eagan, 2005)

(63.7%) of all the asthmatic patients had family history of asthma with no significant association regarding asthma control (p-value=0.9) between poor / not well control and well control asthma. the most likely reason is that both groups are asthmatics ,other study indicates that airway responsiveness can be present early in life and suggests that a family history of asthma or parental smoking contributes to elevated levels of airway responsiveness at an early age. (Sally *et al*, 1991)

(86.2%) of poor control asthma reported history of visit emergency room in the past year compared with (63.6%) in well control asthma, with significant association between the groups (p-value=0.02) .asthma morbidity is high, with unacceptably high reliance on the use of emergency or rescue care.this places a great burden on health care system and society as a while in high and low income countries, and to assess the impact of the availability and affordability of adequate medication on morbidity and mortality from asthma and may be because the majority (72.5%) of all the participant in this study were poor/ not well control asthma (Chan-Yeung M,2003) .

Meanwhile, 85% reported no history of hospitalization in past year with no significant difference between asthma groups (p-value= 0.624) likely because all the participant were asthmatic .(50%) of total asthmatic patients were on formal smoker with significant association regarding smoking status between study groups(p-value=0.000) , (55.2%) of poor control asthma were formal smoker compared with (65%) in well control asthma and (12%) of poor control asthma were never smoker compared with 54.5% in well control asthma .

Smoking can trigger asthma symptoms, while secondhand smoke is known to exacerbate asthma and it may also be a risk factor for the development of asthma (Gilmour *et al*, 2006). (DiFranza, 2004)( Goksö, 2007) ,

Smoking is associated with increased severity of asthma symptoms, reduced quality of life, and increased utilization of health care services among individuals with asthma (Strine *et al*., 2007) (Eisner *et al.,*2007).Smokers are also more likely to have uncontrolled asthma (Chapman *et al,*2008) (Schatz *et al.,* 2006) (Laforest *et al.,* 2006) and a decreased responsiveness to inhaled corticosteriods, a medication used to control

asthma symptoms and prevent exacerbations( Chalmers *et al*., 2002; Tomlinson *et al.,*2005) (Lazarus *et al.,*2007) Smoking cessation and, to a lesser extent reductions in daily smoking have been shown to improve asthma management (Stein *et al.,*2005) (Tønnesen *et al.,* 2004).

co-morbid conditions are associated with more complex health care needs, including an increased need for medication and the increased possibility of drug interactions due to multiple drugs being used to treat multiple conditions

Individuals with asthma are more likely to report other chronic conditions compared with people without asthma, (Prosser R, Carleton B, Smith Am2010) (Soriano JB, Visick GT, etal.,2005) and many of the conditions reported are not respiratory conditions (Boutin-Forzano S, et al.,2007) in this study (71.3%) of all asthmatic patients reported history of chronic disease(diabetes, systemic arterial hypertension, allergic rhinitis, GER) when (72.4%, 68%) of poor and well asthma control respectively with no significant association between the asthma groups (p-value=0.685). The National Heart, Lung, and Blood Institute (NHLBI) Expert Panel Report 3 (EPR 3) Guidelines for the Diagnosis and Management of Asthma recommends that health care providers evaluate patients for the presence of a chronic co-morbid condition when their asthma cannot be well controlled.

There was significant association regarding current use of medication in the past 4 weeks between the asthma groups (p-value=0.000) when (46.5%) of poor asthma control use ICS compare with(45.5%) of well asthma control group use Ratio ICS/LABA. People with persistent asthma need to take medication on a daily basis to keep their asthma under control, even if there are no symptoms of active asthma on a given day. Medications taken daily for asthma are called "long-term controller" medicines

Some controller medicines are delivered by inhaler, while others are taken as a tablet. The doses and types of controller medications prescribed depend upon your asthma severity and level of symptom control

Inhaled steroids—Inhaled steroids (also known as glucocorticoids) act to decrease inflammation (swelling) of the airways over time. The steroids used to treat asthma are different from the ones athletes take to build muscle. Regular treatment with an inhaled steroid reduces the frequency of symptoms (and the need for inhaled bronchodilators for symptom relief), improves quality of life, and decreases the risk of serious attacks.

A number of different inhaled steroid medications are available, all of which are taken once or twice a day. An inhaled bronchodilator is still used as needed for relief of symptoms and before exposure to asthma triggers. There is no need to take the inhaled bronchodilator before each daily dose of inhaled steroid. Side effects of inhaled steroids — Unlike steroids that are taken as tablet or liquid by mouth, very little of the inhaled steroid is absorbed into the bloodstream, and there are few side effects. However, as the dose of inhaled steroid is increased, more of the medication is absorbed into the bloodstream, and the risk of side effects increases.

The most common side effect of low-dose inhaled steroid is oral candidiasis (thrush). This can usually be prevented by taking inhaled steroids from a metered dose inhaler with a spacer (which helps to deliver medication to the lungs, rather than the mouth) (picture 1). You should rinse your mouth or brush your teeth and tongue immediately after inhalation. A hoarse voice and sore throat (without thrush) are less common side effects that are usually managed by changing to a different inhaled steroid preparation

Rare but possible side effects of long-term high-dose inhaled steroid treatments, besides oral candidiasis, include cataracts, increased pressure in the eye (glaucoma), easy bruising of the skin, and increased bone loss (osteoporosis). The risk of these complications is far less with inhaled glucocorticoids compared with oral glucocorticoids (eg, prednisone). Nevertheless, every effort should be made to use the lowest possible dose that controls asthma and minimizes the risk of an asthma attack (National Asthma Education and Prevention Program: Expert panel report III,2007)

Short-Acting Beta2-Agonists do not reduce inflammation or airway responsiveness but serve as bronchodilators, relaxing and opening constricted airways during an acute asthma attack. They are used alone only for patients with mild and intermittent asthma. Patients with more severe cases should use them in combination with other drugs.

Long-acting beta2-agonists (LABAs) are used for preventing an asthma attack (not for treating attack symptoms). These drugs should never be used alone in the treatment of asthma in adults or children. They can be dangerous when used alone, because they can mask asthma symptoms, and they can increase the risk of asthma death unless paired with an inhaled steroid. LABAs should only be used in combination with an asthma controller medication, such as an inhaled corticosteroid. LABAs should be used for the shortest time possible, and should only be used by patients whose asthma is not adequately controlled by asthma controller medications.

Salmeterol-fluticasone (Advair), formoterol-budesonide (Symbicort), and formoterol-mometasone (Dulera) are long-acting beta2 agonists products combined with a steroid in a single inhaler that are used for treatment of moderate-to-severe asthma. The LABA-only versions of these drugs are salmeterol (Serevent Diskus) and formoterol (Foradil Aerolizer) Salpeter *et al.,* 2006) (Sindi *et al.,* 2009)

this study represent unacceptable high level of asthmatic patient with poor asthma control , with the vast majority of patients not received appropriate diagnosis , treatement and failing to achieve the goals of control set . this places a great burden on the health care system and society and loss of time from work ,therefore we need to educate doctors and patients that, by following an asthma management strategy to achieve and maintain control of the disease.

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**Table 1 : Distribution of asthmatic patients by socio-demographic characteristics (n= 80)**

|  |  |  |
| --- | --- | --- |
| Percentage (%) | frequency | variable |
| 63.836.3 | 5129 | Age groups18-4041-65 |
| 32.567.5 | 2654 | GenderMaleFemale |
| 52.547.5 | 4238 | ResidenceUrbanRural |
| 18.831.250 | 152540 | OccupationGovernorateSelf-employmentUnemployment |
| 32.567.5 | 2654 | Marital stateMarriedWidow,single,divoced |
| 68.831.3 | 5523 | Absence from workYesNo |

**Table 2 : Distribution of asthmatic patients by anthropometric measures (n=80)**

|  |  |  |
| --- | --- | --- |
| Percent (%) | Frequency | Variable |
| 7.523.741.327.5 | 6193322 | BMI (kg/ m2 )< 18.518.5-24.925-29.9≥ 30 |
| 51.33018.7 | 412415 | Waist/ Hip RatioHigh RiskModerate RiskLow Risk |

**Table 3 : Distribution of asthmatic patients by medical history (n=80)**

|  |  |  |
| --- | --- | --- |
| Percent (%) | Frequency | variable |
| 143630 | 62428 | Onset of asthma< 20 years old20-40 years old>40 years old |
| 26.331.242.5 | 212534 | Duration of asthma<5 years5-10 years>10 years |
| 63.836.2 | 5129 | Family history of asthmaYesNo |
| 1585 | 1268 | History of hospitalization in past yearYesNo |
| 68.831.2 | 5525 | History of visit emergency in past yearYesNo |
| 36.3252018.8 | 29201615 | Current use of medication (past 4 weeks)Use of icsUse quick relieve treatment Ratio ics / SABARatio ics / LABA |
| 23.85026.2 | 194021 | Smoking statusneverformercurrent |
| 71.328.7 | 5723 | history of chronic disease(diabetes, systemic arterial hypertension, allergic rhinitis,GER)YesNo |

**Table 4: Association of asthma control test score with socio-demographic Characteristics (n=80)**

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| p- value | df | χ2 | Total (%) | Well asthma controlACT(20-25) (%) | Poor asthmacontrol ACT< 20 (%) | Variable |
| 0.990 | 1 | 0.00 | 51(63.7)29(36.3)**80(100)** | 14(63.6)8(36.4)**22(100)** | 37(63.8)21(36.2)**58(100)** | Age groups18-4041-65**Total** |
| 0.539 | 1 | 0.378 | 26(32.5)54(67.5)**80(100)** | 6(27.3)16(72.7)**22(100)** | 20(34.5)38(65.5)**58(100)** | GenderMaleFemale**Total** |
| 0.023\* | 1 | 5.205 | 42(52.5)38(47.5)**80(100)** | 7(31.8)15(68.2)**22(100)** | 35(60.3)23(39.7)**58(100)** | ResidenceUrbanRural**Total** |
| 0.181 | 2 | 3.419 | 15(18.7)25(31.340(50)**80(100)** | 7(31.8)6(27.2)9(41)**22(100)** | 8(13.8)19(32.8)31(53.4)**58(100)** | OccupationGovernorateSelf-employmentUnemployment**Total** |
| 0.128 | 1 | 2.321 | 26(32.5)54(67.5)**80(100)** | 10(45.5)12(54.5)**22(100)** | 16(27.6)42(72.4)**58(100)** | Marital stateMarriedWidow,single,divosed**Total** |
| 0.251 | 1 | 1.318 | 55(68.7)25(31.3)**80(100)** | 13(59)9(41)**22(100)** | 42(72.4)16(27.6)**58(100)** | Absence from workYesNo**Total** |

\*p value ≤ 0.05 is significant

**Table 5 : Association of asthma control test degree by anthropometric measures (n=80)**

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| P-value | df | χ2 | Total(%) | Well asthma controlACT(20-25)(%) | Poor/not well control asthma ACT<20(%) | Variable |
| 0.000\* | 3 | 19.684 | 6(7.2)19(23.7)33(41.3)22(27.5)**80(100)** | 4(18.2)11(50)5(22.7)2(9.1)**22(100)** | 2(3.4)8(13.7)28(48.4)20(34.5)**58(100)** | BMI (kg/ m2)<18.518.5-24.925-29.9≥ 30**Total** |
| 0.032\* | 2 | 6.781 | 41(51.3)24(30)15(18.7)**80(100)** | 8(36.4)11(50)3(13.6)**22(100)** | 33(56.8)13(22.4)12(20.7)**58(100)** | Waist/ Hip RatioHigh RiskModerate RiskLow RiskTotal |

\*p value ≤ 0.05 is significant, BMI=body mass index

**Table 6: Association of asthma control test degree with medical history (n=80)**

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| P-value | df | 2χ | Total(%) | Well asthma control\*\*\*(%) | Poor/not well asthma control\*\* (%) | Variable |
| 0.001\* | 2 | 13.315 | 14(17.5)36(45)30(37.5)80(100) | 8(36.4)12(54.5)2(9.1)22(100) | 6(10.3)24(41.4)28(48.3)58(100) | Onset of asthma<20 years old20-40 years old>40 years oldTotal |
| 0.002\* | 2 | 12.569 | 21(26.3)25(31.2)34(42.5)80(100) | 12(54.5)4(18.1)6(27.3)22(100) | 9(15.5)21(36.2)28(48.3)58(100) | Duration of asthma<5 years5-10years>10 yearsTotal |
| 0.9 | 1 | 0.000 | 51(63.7)29(36.3)80(100) | 14(63.6)8(36.4)22(100) | 37(63.7)21(36.2)58(100) | Family history of asthmaYesNoTotal |
| 0.624 | 1 | 0.241 | 12(15)68(85)80(100) | 4(18.2)18(81.8)22(100) | 8(13.7)50(86.2)58(100) | History of hospitalization in past yearYesNototal |
| 0.02\* | 1 | 5.078 | 64(80)16 (20)80(100) | 14(63.6)8(36.4)22(100) | 50(86.2)8(13.8)58(100) | History of visit emergency room in the past yearYesNototal |
| 0.000\* | 3 | 19.083 | 29(36.3)20(25)16(20)15(18.7)80(100) | 2(9)4(18.1)6(27.4)10(45.5)22(100) | 27(46.5)16(27.6)10(17.3)5(8.6)58(100) | Current use of medication (past 4 weeks)Use of ICSUse of quick relief treatmentRatio ICS/SABARatio ICS/LABATotal |
| 0.000\* | 2 | 16.649 | 19(23.8)40(50)21(26.2)80(100) | 12(54.5)8(36.5)2(9)22(100) | 7(12)32(55.2)19(32.8)58(100) | Smoking statusNever smokerFormal smokerCurrent smokerTotal |
| 0.685 | 1 | 0.164 | 57(71.3)23(28.7)80(100) | 15(68)7(32)22(100) | 42(72.4)16(27.6)58(100) | history of chronic disease(diabetes, systemic arterial hypertension, allergic rhinitis, GER)YesNoTotal |

\*p value ≤ 0.05 is significant , ICS= inhaled corticosteroid , SABA= short-acting beta 2 agonist, LABA=long –acting beta 2 agonist