IJASR International Journal of Academic Scientific Research
ISSN: 2272-6446 Volume 3, Issue 3 (September - October 2015), PP 32-39
www.ijasrjournal.org

Patterns of Asthma control therapy and assessment of asthma control in major hospitals of Qassim region

Abdulaziz Faraj Aljohani[1], Moeen Zafar Khan[2], Ziyad Muawwadh Aljohani[3], Osama Adel Alahmadi[3], Samah A. Aljohani[4], Alaa Aljohani[4]

[1] Department of Emergency Medicine , Ohoud Hospital , Madinah , Saudi Arabia
[2] Department of Internal Medicine , Qassim University , Qassim , Saudi Arabia
[3] collage of medicine , Taibah University , Madinah , Saudi Arabia
[4] Department of surgery, Ohoud Hospital , Madinah , Saudi Arabia

ABSTRACT

BACKGROUND & OBJECTIVES*: Bronchial asthma is one of the most common illnesses in Saudi Arabia. Proper management of the patients prevents exacerbations. Local and international studies indicate that there are frequent errors causing improper management and increased work load on the Emergency departments of the major hospitals. In this study we looked at the prescription patterns for the control of asthma symptoms and the level of asthma control at the outpatient departments in major hospitals of Qassim region, we also assessed the awareness of physicians about Saudi initiative for Asthma (SINA) guidelines.*

METHODS: *We visited outpatient departments (OPD) of various major hospitals of Qassim region i.e. King Fahad Specialist Hospital (KFSH) Buraidah, King Saud Hospital Unaizah, and Al-Rass general hospital .We interviewed patients who had been diagnosed with bronchial asthma and were prescribed asthma controller therapy and collected data from their prescription slips and case records. We assessed the level of asthma control by using asthma control test as per SINA guidelines. We also circulated questionnaire to the physicians engaged in management of asthma patients, asking for their awareness of SINA guidelines for management of asthma.*

RESULTS*: The total number of patients was 67 with 46.3% male (n=31) and 53.7% female (n=36). The mean age was 40.61±16.901 years. The distribution of patients was 64.2% (43/67) from King Fahad specialist's hospital, 17.9% (12/67) from King Saud hospital and 17.9% (12/67) from Alrass general hospital.*

The most frequently prescribed therapy was short acting beta 2 agonist inhalation SABA 79.1% (53/67) followed by Long acting beta 2 agonist with high dose corticosteroid inhalation LABA+HICS 73.1% (49/67); inhaled anticholinergic 23.9% (16/67); low dose inhaled corticosteroids 6% (4/67); oral xanthines 6% (4/67) and high dose inhaled corticosteroids 3% (2/67). The asthma control was assessed in 24/67 patients and the mean score was 16.12±3.82 showing partial control. The awareness of SINA guidelines among the physicians was very low 8.3% (1/12).

CONCLUSION*: The most common mode of prescription to control asthma symptoms is a combination therapy, with SABA prescribed most frequently followed by LABA+HICS. The control of asthma symptoms is unsatisfactory and there is very low level of awareness among the physicians about the Saudi guidelines for control of asthma.*

Keywords: *Prescription patterns, Asthma, Qassim.*

INTRODUCTION

Asthma is a common chronic disorder of the airways, characterized by variable reversible and recurring symptoms related to airflow obstruction, bronchial hyperresponsiveness, and an underlying inflammation. It is one of the most common chronic diseases in Saudi Arabia, affecting more than 2 million Saudis [1], the prevalence rate is around 25% [2]. Its prevalence is increasing all over the world as well as in KSA [3]. It has no specific cause but there is genetic predisposition as well as environmental and immunologic factors contribute to its etiology [4].

The prevalence of allergic symptoms was found to be significantly greater among urban children than the rural ones and more among Saudi children than non-Saudi children [5]. Improperly treated asthma is an economic burden for the country in the form of loss of working hours and expensive treatment regimens in the emergency care. Inadequate prescriptions also affect quality of life of asthma patients [6]. There are specified guidelines for the management of asthma provided by Saudi Thoracic Society (STS) called SINA guidelines [7]. Local and international studies have shown that not all physicians are fully aware of the guidelines and there are frequent inappropriate prescriptions [8].

A Saudi study have shown that only 39% of primary care physicians meet the standards of the national guidelines in management of asthma [9]. Furthermore, the overall level of awareness among physicians was low . Their proficiency in general knowledge, diagnosis, classification of severity and management was also low [7].

Diagnosis of asthma

The clinical assessment of asthma includes a detailed history and physical examination supplemented by spirometry, with reversibility testing, to support the diagnosis. To date, there is no single diagnostic test to confirm asthma, although the assessment of asthma history is helpful in this regard [10, 11].

The symptoms of wheezing, cough, shortness of breath, and chest tightness are not specific for bronchial asthma and can be seen with other pulmonary diseases. These symptoms are variable over time and the patient may be entirely asymptomatic between attacks [12].

Symptoms are usually worse at night, particularly in children, and could be provoked by exercise or other triggering factors. Some patients, particularly children, have a cough as the main or the only symptom without wheezing or shortness of breath, which is called cough variant asthma. Others may have their asthma induced by exercise only, a condition called exercise-induced asthma (EIA). Symptoms of asthma could be worsened by coexistent gastro-esophageal reflux disease (GERD), rhinosinusitis, or the use of some medications such as beta blockers and nonsteroidal anti-inflammatory agents (NSAID), and Aspirin. Asthma and rhinosinusitis commonly occurs concomitantly [13].

Physical examination usually reveals bilateral expiratory wheezing, which may be absent between attacks. Examination of the upper airways is important to look for evidence of allergic rhinitis. Other allergic manifestations, such as atopic dermatitis eczema may also support the diagnosis of allergic Spirometry is necessary to confirm airflow obstruction, assess its severity and asthma [14].

to demonstrate significant reversibility. Normal spirometry does not rule out the diagnosis of asthma. Serial peak expiratory flow (PEFR) measurement may be helpful in asthma diagnosis and follow-up. Bronchoprovocation testing is another tool used by specialists [15]. Chest x-ray is not recommended unless the diagnosis is in doubt, symptoms are not typical, or to rule out other diagnoses. Peripheral eosinophilia and elevated IgE level are supportive of the diagnosis, but are not routinely recommended. Skin testing and radioallergosorbent test (RAST) may be helpful in identifying allergens to which the patient has been sensitized and to develop a strategy for avoiding allergen exposure [16].

Medications Used for the Treatment of Asthma

The objective of asthma treatment is to achieve and maintain control of the disease. Medications used to treat asthma can be classified as controllers or relievers. ***Controllers*** are medications taken daily on a long-term basis to keep asthma under clinical control mainly through their anti-inflammatory effects. ***Relievers*** are medications used on an "as-needed basis" that act quickly to reverse bronchoconstriction and relieve symptoms

[7].

Controller medications

Inhaled corticosteroids: Inhaled corticosteroids (ICS) are currently the most effective anti-inflammatory medications for the treatment of asthma [17, 18] They reduce symptoms, improve the quality of life, improve lung function, decrease airway hyperresponsiveness, control airway inflammation, reduce frequency and severity of exacerbations, and reduce asthma mortality [19]. When they are discontinued, deterioration of clinical control follows within weeks to months in most patients [20]. Most of the benefits from ICS are achieved in adults at relatively low doses [21]. Inhaled Corticosteroids are generally safe and well-tolerated [22].

Long-acting inhaled ß2-agonists*:* Long-acting inhaled *ß2*-agonists (LABAs), including formoterol and salmeterol, should not be used as mono-therapy in asthma but combination with ICS improves symptoms, and achieves clinical control of asthma in most patients, more rapidly [23]. Fixed combination inhalers are available in the form of uticasone and salmeterol (Seretide) or budesonide and formoterol (Symbicort).

Leukotriene modifiers*:* Leukotriene modifiers (LTRA) reduce airway inflammation and improve asthma symptoms and lung function but with a less consistent effect on exacerbations, especially when compared to ICS [24]. However, when used alone as a controller, their effects are generally less than that of low dose ICS. When added to ICS, LTRA may reduce the dose of ICS required by patients with uncontrolled asthma, and may improve asthma control [25].

Theophylline: Theophylline (xanthine) is a weak bronchodilator with anti-inflammatory properties.It may provide benefits as an add-on therapy in patients who do not achieve control with ICS alone, but is less effective than LABA and LTRA. Theophylline is not recommended for use as monotherapy in asthma treatment [26].

Anti-IgE*:* Anti-IgE (Omalizumab) use is indicated for patients of 12 years and above with severe allergiċ asthma uncontrolled on high dose ICS and other controllers [27]. As this drug is expensive and requires careful monitoring, it should only be used by a specialist [28].

Oral ß2-agonists*:* The side effect profile is much higher than that of inhaled B2-agonists. Therefore, their use is highly discouraged [26].

Systemic corticosteroids*:* Long-term oral glucocorticosteroid therapy (excluding short courses for acute attacks of asthma for a period of 1-2 weeks) may be required to control the difficult asthma despite maximum standard therapy [29].

Reliever medications

Relievers are medications used on as-needed basis that act quickly to reverse bronchoconstriction and relieve symptoms [29].

Rapid onset inhaled ß2-agonists*:* Short acting ß2 agonist (SABA) such as salbutamol is the drug of choice for relief of symptoms of acute attacks of asthma and for the pretreatment of exercise-induced bronchoconstriction [30]. Formoterol is used for symptom relief because of its rapid onset of action. However, when it is used for maintenance therapy, it should always be given with ICS [31].

Anticholinergics: Anticholinergics, in asthma, are less effective than SABA. However, when used in combination with SABA in acute asthma, they have an additional effect. They are not known to have benefits in long-term management of asthma[32].

***Theophylline**:* There is no evidence supporting the routine use of theophylline in treating acute asthma and its use is discouraged.

Assessment of Asthma Control

Asthma control may be easily assessed by using the asthma control questionnaire with score above 20 indicating good control of asthma [33].

Objectives

The objectives of our study are :

1. To find out the common patterns of prescriptions for asthma control therapy in major hospitals of Qassim.
2. To assess level of asthma control by using asthma control test.
3. To assess physicians awareness regarding SINA guidelines.

MATERIAL AND METHODS

Study design:

Cross-sectional survey

Sample size:

We estimated sample size of 100 using the formula

$$n = \frac{Z^2 \cdot P(1-P)}{d^2}$$

Assuming the prevalence of asthma to be 25 % in the population and absolute precision to be 0.50%, but we collected a sample of 67 patients due to logistic and temporal issues.

Sampling technique:

Non-probability purposive sampling

Inclusion criteria:

Diagnosed case of bronchial asthma.

Exclusion criteria:

Patients diagnosed with COPD and used beta-blocker drugs for any reason.

Methods:

We visited outpatient departments of major hospitals of Qassim region i.e. King Fahad Specialist Hospital (KFSH) Buraidah, King Saud Hospital Unaizah, and Al-Rass general hospital .We interviewed patients who had been diagnosed with bronchial asthma and prescribed asthma controller therapy at the time they visited OPD. Informed verbal consent was obtained from study participant . For randomization, an online program called 'Research Randomizer was used and as per the suggestion of this program we chose patients number 4, 6, 9, 10 and 16 from each outpatient visit. After that we collected an additional data from the case records of these patients. There were 10 - 30 patients in each sub-sample. All the collected data remained confidential. To maintain confidentiality we assigned code numbers to the patients. We assessed the control of asthma by using asthma control test questionnaire and we also distributed a questionnaire to the physicians about their knowledge regarding the SINA guidelines.

Ethical approval:

Complete ethical approval was obtained from the regional ethical committee and the directors of the respective hospitals.

***Statistical analysis*:**

SPSS 15.0 was used to tabulate data and statistical analysis. Chi square test and student's' test were used to compare the data when needed.

RESULTS

The total number of patients was 67 (Figure B). The mean age was 40.61±16.901 years. The distribution of patients was 64.2% (43/67) from King Fahad specialist's hospital, 17.9% (12/67) from King Saud hospital and 17.9% (12/67) from Alrass general hospital.

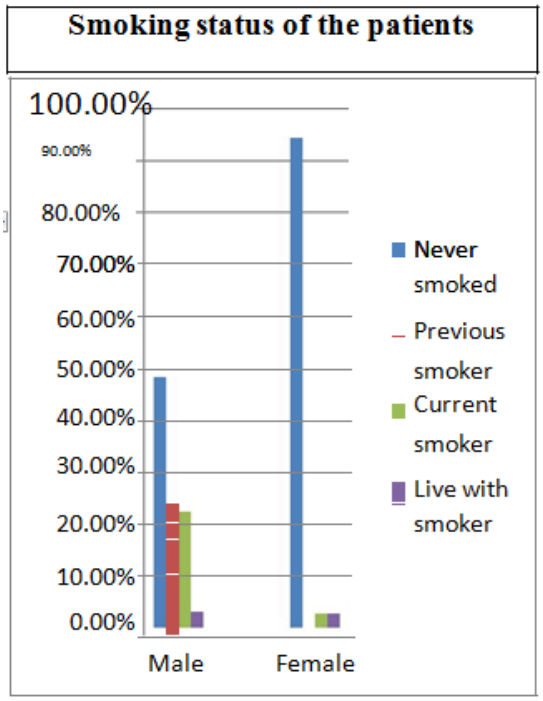

Figure A

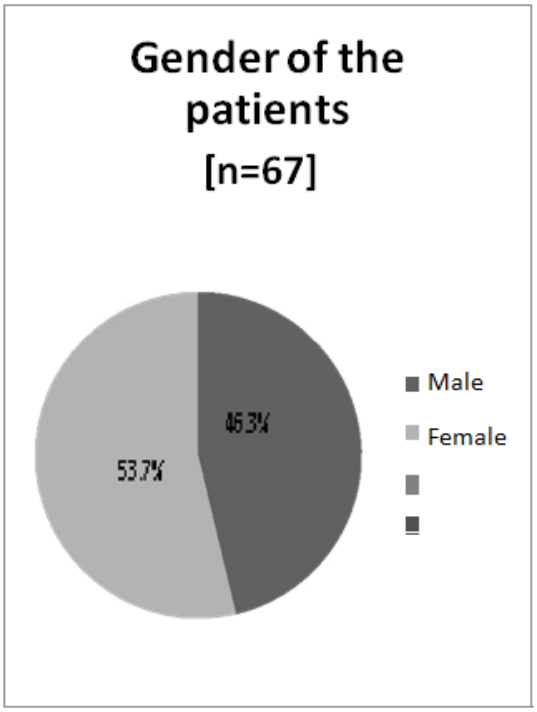

Figure B

Figure A shows the smoking status among the male patients, 48.3% never smoked (n=15); 25.8% previously smoked (n=8); 22.5% current smokers (n=7) and 3.2% live with smoker (n=1). Among the female patients 94.4% never smoked (n=34); none as previous smoker; 2.7 % current smoker (n=1) and 2.7% live with smoker (n=1).

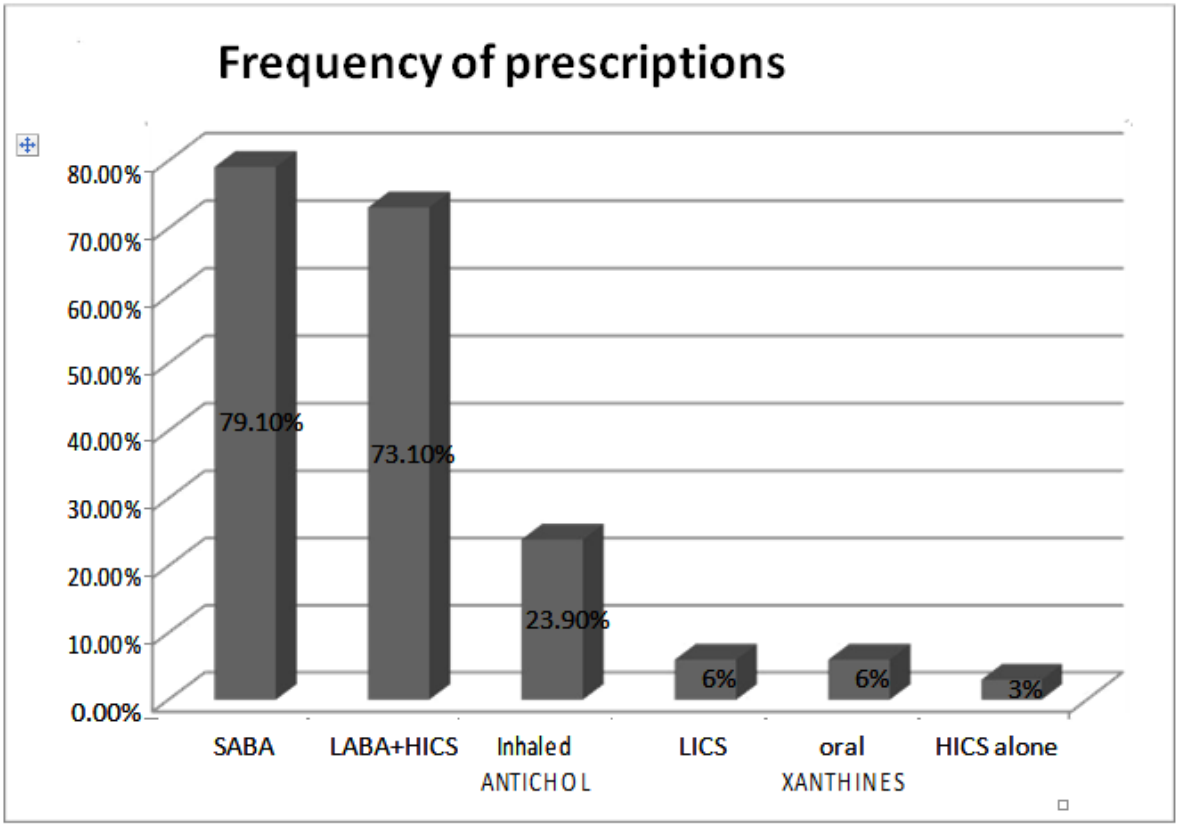

Figure C

The most frequently prescribed therapy was short acting beta 2 agonist inhalation SABA 79.1% (53/67) followed by Long acting beta 2 agonist with high dose corticosteroid inhalation LABA+HICS 73.1% (49/67); inhaled anticholinergic 23.9% (16/67); low dose inhaled corticosteroids 6% (4/67); oral xanthines 6% (4/67) and high dose inhaled corticosteroids 3% (2/67) Figure C.

There was no significant difference in the prescription of SABA to the male and the female patients (p=0.507) with SABA prescribed to 80.6% of the male patients (n=25) and 77.7% of the female patients (n=28). There was no significant difference in the prescription of LABA with high dose ICS between male and female patients (p=0.539) with therapy being given to 74.1% of male (n=23) and 72.2% of female patients (n= 26).

There was no age predilection for the most commonly prescribed therapies with SABA prescribed to 83.3% of age group <20 yrs (n=5/6); 74.07% of age group 20-39 years (n=20/27); 79.01% of age group 40-59 yrs (n=19/24) and 90% of age group ≥60 years (n=9/10) with p=0.754. Prescription of LABA with high dose ICS was 50% in age group <20 yrs (n=3/6); 81.4% in age group 20-39 years (n=22/27); 62.5% in age group 40-59 yrs (n=15/24) and 90% in age group ≥60 years (n=9/10) with p=0.143.

The asthma control test questionnaire was answered by 24 patients and the mean score was 16.12±3.82 showing partial control with 12/24 patients showing poor control (score <16). The awareness of SINA guidelines among the physicians was very low 8.3% (1/12).

DISCUSSION

Our results show inhaled SABA to be the most commonly prescribed asthma control therapy. This conforms with Dashash NA et al [34] who found the above medication to be prescribed to 56% of their patients but they found that oral SABA (salbutamol) was the most commonly prescribed medication, this difference is probably due to the age group, they assessed the asthma therapy in children only whereas we looked at all the age groups with adults (>20 years) being 91% in our study, and it is well known that children find it difficult to use the inhalers.

Our result do not fully coincide with those of Thomas M et al [35] who found ICS monotherapy to be the most commonly prescribed asthma controller therapy and LABA with HICS to be the second most common prescription, we also found it to be the second most common prescription in our patients, the difference is again explained by the fact that their target population was children and not a mixed population as in our case. It was not surprising to find the LABA monotherapy to be absent in our cases as there have been reports of adverse outcomes with this form of therapy [36].The level of control of asthma symptoms was largely unsatisfactory but the number of patients answering the questionnaire was low 24/67. Similar results have been reported by Hamdan H [33].

We found the physicians to be largely unaware of the current guidelines called SINA and this is in coincidence with other published work where it was found that the reason for asthma exacerbations and overload on the emergency departments is the unawareness of the treating doctors with the national and international guidelines that causes under treatment of patients.

Limitation of the study

Our study is limited by the small number of the patients as the time duration of the survey was limited and there were logistic issues as the interviewers and the researchers were medical students who were busy in their routine studies.

CONCLUSION

The most common mode of prescription to control asthma symptoms is a combination therapy, with SABA prescribed most frequently followed by LABA+HICS. This form of therapy is prescribed to the patients irrespective of the age and the gender.The control of asthma is generally unsatisfactory with most patients showing partial control.There is very low level of awareness among the physicians about the Saudi guidelines for control of asthma i.e. SINA.

REFERENCES

1. Al Frayh AR, Shakoor Z, Gad El Rab MO, Hasnain SM. Increased prevalence of asthma in Saudi Arabia. Ann Allergy Asthma Immunol 2001;86:292-6.
2. A.R. Al Frayh; Z. Shakoor; M.O. Gad El Rab; and S.M. Hasnain. Increased prevalence of asthma in Saudi Arabia. Ann Allergy Asthma Immunol. 2001 Mar;86(3):292-6.
3. Al-Hajjaj M. Bronchial asthma in developing countries: A major social and economic burden. Ann Torac Med 2008; 3:30-40.
4. . Hamid Q, Tulis M. New insights into the pathophysiology of small airways in asthma. Ann Thorac Med 2007; 2:28-33.
5. Alshehri MA, Abolfotouh MA, Sadeg A, Al Najjar YM, Asindi AA, Al Harthi AM, *et al*. Screening for Asthma and associated risk factors among urban school boys in Abha city. Saudi Med J 2000;21:1048-53.
6. Spreight A, Lee D, Hey E. Underdiagnosis and under treatment of asthma in childhood. Br Med J 1983; 286:1253-6.
7. Mohamed S, Al-Moamary, Mohamed S. Al-Hajjaj, Majdy M. Idress, Mohamed O. Zeitouni, Mohamed O. Alanezi, Hamdan H. Al-Jahdali, Maha Al Dabbagh. The Saudi initiative for asthma. Annals of Thoracic Medicine 2009; 4; 216-224.
8. Abudahish A, Bella H. Primary care physician's perceptions and practices on asthma care in Aseer region, Saudi Arabia. Saudi Med J 2006; 27:333-7.
9. Al-Kabbaa A, Al-Shamrani K, Salih MA. Does the management of bronchial asthma by family physicians meet standards of the national protocol? J Fam Comm Med 2002;9:21-5.

10. Stempel DA, McLaughin TP, Stanford RH, Fuhlbrigge AL. Patterns of asthma control: A 3-year analysis of patient claims J Allergy Clin Immunol 2005;115:935-9.
11. Horne R, Price D, Cleland J, Costa R, Covey D, Gruffydd-Jones K, *et al*. Can asthma control be improved by understanding the patient's perspective? BMC Pulm Med 2007;7:8.
12. Kempel DA, McLaughin TP, Stanford RH, Fuhlbrigge AL. Patterns of asthma control: A 3-year analysis of patient claims. J Allergy Clin Immunol 2005;115:935-9. Berlow BA. Eight key questions to ask when your patient with asthma doesn't get
13. better. Am Fam Physician 1997;55:183-89,192-4.
14. Fireman P. Rhinitis and asthma connection: Management of coexisting upper airway allergic diseases and asthma. Allergy Asthma Proc 2000;21:45-54.
15. Jadad AR, Moher M, Browman GP, Booker L, Sigouin C, Fuentes M, *et al*. Systematic reviews and meta-analyses on treatment of asthma: Critical evaluation. BMJ 2000;320:537-40.
16. Witteman A, Stapel S, Perdok G, Sjamsoedin D, Jansen H, Aalberse R, et al. The relationship between RAST and skin test results in patients with asthma or rhinitis: A quantitative study with purifi ed major allergens. J Allergy Clin Immunol 1996;97:16-25.
17. Lemanske RF Jr, Sorkness CA, Mauger EA, Lazarus SC, Boushey HA, Fahy JV, *et al*. Inhaled corticosteroid reduction and elimination in patients with persistent asthma receiving salmeterol. JAMA 2001;285:2594-603.
18. Pauwels RA, Pedersen S, Busse WW, Tan WC, Chen YZ, Ohlsson SV, *et al*. Early intervention with budesonide in mild persistent asthma: A randomised, double-blind trial. Lancet 2003;361:1071-6.
19. Barnes P, Pedersen S. Efficacy and safety of inhaled corticosteroids in asthma. Am Rev Respir Dis 1993;148:S1-26.
20. Haahtela T, Jarvinen M, Kava T, Kiviranta K, Koskinen S, Lehtonen K, *et al*. Effects of reducing or discontinuing inhaled budesonide in patients with mild asthma. N Engl J Med 1994;331:700-5.
21. Kelly H. Comparison of inhaled corticosteroids: An update. Ann Pharmacother 2009;43:519-27.
22. Dubus J, Marguet C, Deschildre A, Mely L, Le Roux P, Brouard J, *et al*. Local side-effects of inhaled corticosteroids in asthmatic children: In uence of drug, dose, age, and device. Allergy 2001;56:944-8.
23. Wenzel S, Lumry W, Manning M, Kalberg C, Cox F, Emmett A, et al. Effi cacy, safety, and effects on quality of life of salmeterol versus albuterol in patients with mild to moderate persistent asthma. Ann Allergy Asthma Immunol 1998;80:463-70.
24. Leff J, Busse W, Pearlman D, Bronsky E, Kemp J, Hendeles L, *et al*. Montelukast: A leukotriene-receptor antagonist, for the treatment of mild asthma and exercise-induced bronchoconstriction. N Engl J Med 1998;339:147-52.
25. Idrees M, Al-Moamary M. Blocking leukotrienes optimize Asthma control: The BLOC survey. Ann Thorac Med 2007;2:99-102.
26. Green R, Brightling C, Pavord I, Wardlaw A. Management of asthma in adults: Current therapy and future directions. Postgrad Med J 2003;79:259-67.
27. Busse W, Corren J, Lanier BQ, McAlary M, Fowler-Taylor A, Cioppa GD, *et al*. Omalizumab, anti-IgE recombinant humanized monoclonal antibody, for the treatment of severe allergic Asthma. J Allergy Clin Immunol 2001;108:184-90.
28. Prenner BM. Asthma 2008: Targeting immunoglobulin E to achieve disease control. J Asthma 2008;45:429-36.
29. Mash B, Bheekie A, Jones PW. Inhaled vs oral steroids for adults with chronic asthma. Cochrane Database Syst Rev 2001;1:CD002160.
30. Waldeck B. Enantiomers of bronchodilating beta2-adrenoceptor agonists: Is there a cause for concern? J Allergy Clin Immunol 1999;103:742-8.
31. O'Byrne PM, Kerstjens H. Inhaled {beta}-agonists in the treatment of asthma. N Engl J Med 1996;335:886-8.
32. Rodrigo G, Rodrigo C, Burschtin O. A meta-analysis of the effects of ipratropium bromide in adults with acute asthma. Am J Med 1999;107:363-70.
33. Hamdan H.Al-jahadali et al. Asthma control assessment using asthma control test among patients attending 5 tertiary care hospitals in Saudi Arabia. Saudi Medical J 2008; Vol.29 (5): 714-717.
34. Dashash NA, Mukhtar SH. Prescribing for asthmatic children in primary care. Saudi Med J 2003; 24:507-11.
35. Thomas M, Thomas TM, Fan T, Williams T, Taylor S. BMC pulmonary medicine 2010;10:29.
36. De Vries F, Setakis E, Zhang B, van Staa TP. Long-acting beta2-agonists in adult asthma and the pattern of risk of death and severe asthma outcomes: a study with the General Practice Research Database. *Eur Respir J.* September 1, 2010vol. 36 no. 3 494-502.