Bull. Pharm. Sci., Assiut University, Vol. 43, Issue 2, 2020, pp. 209-215.

Bulletin of Pharmaceutical Sciences
Assiut University
Website: http://bpsa.journals.ekb.eg/
e-mail: bullpharm@aun.edu.eg

THE PRESCRIBING PATTERN OF ANTI-ASTHMATIC DRUGS FOR THE TREATMENT OF ASTHMA, AT DIFFERENT SETTINGS OF KARACHI, PAKISTAN

Saira Shahnaz*

Department of Pharmacy Practice, Ziauddin University, Karachi, Pakistan

Introduction: *Asthma is a common chronic inflammatory disorder of respiratory airways with high growing prevalence around the globe.*
Objectives: *To evaluate the current prescribing practice and analyze the prescription for rational use of drugs of asthma by comparing with international guidelines of GINA (Global Initiative for Asthma.*
Methodology: *A cross-sectional study was conducted among the patients with confirmed diagnosis of asthma for the period of eight months at different setups of Karachi. The prescription and patients record files were evaluated for prescribing pattern and disease profile of asthma.*
Results: *study concluded 73.5% (n= 735) patients were male, while 26.5% (n= 265) patients were females, 42% (n= 105) patients were from inpatients setting of public sector hospitals, 26.8% (n= 67) from private sector hospital and 50% (n= 250) patients were from private clinics, while 58% (n= 145) were from out-patients departments of public sector hospitals. The inhaled corticosteroids were prescribed to almost more than half of the enrolled patients either monotherapy or combined drugs therapies 44.1% (n= 64), medication of class long acting beta agonists to 22.7% (n= 33) patinets, 17.2% (n= 25) patients were prescribed with leukotriene inhibiters.*
Conclusion: *The asthma treatment guidelines suggests the prescribing of corticosteroids and long acting beta agonists in combinations (LABA's+ICS), that was observed in current study as successful therapy in two drug combinations therapies. Fluticasone+Salmeterol combination was observed as successful therapy.*

INTRODUCTION

Asthma is a disease characterized by chronic inflammation of airways[1]. According to an estimation 300 million people suffers from asthma globally however, 1 death among 250 suffering patients are reported[2]. Prevalence of asthma in children, Pakistan is on 26th number[3]. About 4.3% portion of population of Pakistan is suffering from Asthma[4]. The asthma disorder is commonly characterized by cough, breathlessness, wheeze, obstruction in expiratory airflow and tightness of chest[5&6]. Asthma effects the quality of life and health care cost. The treatment of asthma requires an appropriate management, pharmacological supports and life style modifications specially among children patients[7]. The management of asthma is to maintain the optimal control, less emergency visits, no severe exacerbation of disease[8]. According to reported studies, 0.25 million people die with asthma whereas more than 80% deaths due to asthma are accounted in lower income countries[9]. It is estimated that in 2025, about 100 million more people will be suffering from asthma[10]. Asthma is a chronic and long-term disease, which is influencing the majority of population in developing countries like Pakistan and all over the world[11]. In order to achieve the best control, patient's compliance with rational therapy is most important. Different classes of drugs are used

Received in 31/8/2020 & Accepted in 1/10/2020

*Corresponding author: Saira Shahnaz, E-mail: msairakhan1302@gmail.com

for management, so proper selection of medications depends upon severity of disease and patient's factors[12]. The disease Studies have shown that asthma can be controlled through rational therapy and proper management[13]. As it is chronic disease so needs therapy for long duration effectively. If it is not effectively controlled through proper measures, it can worsen and may lead to death.

METHODOLOGY

The design of study was cross sectional conducted among asthma patients, from May 2019- Jan 2020. Sample size was calculated based on the rate of prevalence of disease. Data was collected from patients' records files and prescriptions included demographic details and required parameters, drugs, dose, and type of therapies for the study on a self-structured questionnaire (designed on the basis of set objectives). Different medical Settings of Karachi (i.e. Government as well private hospitals and also private clinics were approached for the collection of data. Patients consent was obtained before obtaining the patients records, confidentiality of data was maintained. Rationality was analyzed by comparing the prescriptions with the international guidelines or protocols such as GLOBAL INITIATIVE FOR ASTHMA (GINA). Patients of all age groups, (except age less than 5 years) regardless of gender, locality and profession were included, while patients having other complications of chest, like tuberculosis, COPD, pregnant women, cancer, and pneumonia were excluded from the study. Later on, data was analyzed with the help of SPSS version 20.0 for descriptive statistics, for prescription evaluation frequency, percentages mean were calculated.

RESULTS AND DISCUSSION

Results

The data was obtained from total 1000 patients, demographic details showed 73.5% (*n*= 735) patients were male, while 26.5% (*n*= 265) patients were females among them majority of the patients i.e. 46.5% (*n*= 465) were found in the age range of 12-39 years, 19.8% (*n*= 198) patients were with age 40 years and above. Among 1000 patients the residential details showed that 58.3% (*n*= 583) patients were from urban areas, however 41.7% (*n*= 417) patients were from rural areas.

The results showed, 63.1% (*n*= 631) patients had positive family history with disease, 27.1% (*n*= 271) patients represented negative family history with asthma while 9.8% (*n*= 98) patients had no associated details of family disease history as shown in table 1.

Table 1: Demographic details of patients.

Demographic Details of Patients	
Male	(*n*= 735) 73.5%
Females	(*n*= 265) 26.5%
Age wise distribution of patients	
Age 6-11 Years.	*n*= 337 (33.7%)
Age 12-39 Years.	*n*= 465 (46.5%)
Age 40+ Years.	*n*= 198 (19.8%)
Residential Detail of patients	
Urban	*n*= 583 (58.3%)
Rural	*n*= 417 (41.7%)
Family history with Asthma	
Positive Family History	*n*= 631 (63.1%)
Negative Family History	*n*= 271 (27.1%)
Details not mentioned	*n*= 98(9.8%)

It was found that 42% (*n*= 105) patients were from inpatients setting of public sector hospitals, 26.8% (*n*= 67) from private sector hospital and 50% (*n*= 250) patients were from private clinics, while 58% (*n*= 145) patients from out-patients departments of public sector hospitals. 73.2% (*n*= 183) patients from private sector hospitals, while 50% (*n*= 250) patients from private clinic settings as given in table 2.

Among all 1000 asthma patients, the disease was classified into 5 different categories based on types of asthma 25.3% (*n*= 253) patients had persistent asthma, 24.7% (*n*= 247) patients presented mild intermittent asthma, 17.7% (*n*= 177) patients were diagnosed with mild persistent asthma, 26.0% (*n*= 260) patients with moderate persistent asthma, while 6.3% (*n*= 63) patients had severe persistent asthma. As shown in table 3.

Table 2: Patients records from different clinical settings.

Wards	Public sector hospital (*n*= 250)	Private sector hospital (*n*= 250)	Clinic setups (*n*= 500)
Inpatients	105 (42%)	67 (26.8%)	250 (50%)
Out patients	145 (58%	183 (73.2%)	250 (50%)
TOTAL	250	250	500

Table 3: Categorization of patients based of types of asthma.

Classification of Types of Asthma	Number of patients *n* (%)
Type of asthma	
Persistent asthma	253 (25.3%)
Mild intermittent	*n*= 247(24.7%
Mild persistent	*n*= 177 (17.7%)
Moderate persistent	*n*= 260(26.0%)
Severe persistent	*n*= 63(6.3%)

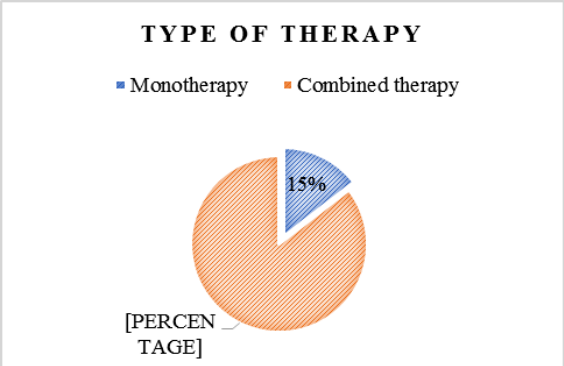

Fig. 1: Types of prescribed therapies.

To evaluate the prescription pattern the prescriptions of patients were observed and found Among mono drug therapies, the mono drugs therapies, were prescribed to 15% patients, while 85% patients were prescribed with combination drugs therapies (Fig. 1). The inhaled corticosteroids were prescribed to 44.1% (*n*= 64), while the Inhaled corticosteroids in two drugs combination with long acting beta agonists were prescribed to 17% (*n*= 170) as 2 drug combination therapies, Fluticasone in combination to Montelukast were prescribed to 9% (*n*= 90), Inhaled corticosteroids in combination to short acting beta agonists were prescribed to 8.7% (*n*= 87) patients.

The majority of patients in 3 drug combination therapies were prescribed with FLT+SAL+MONT= 109 (10.9%) and to 22.7% (*n*= 33) patinet, 17.2% (*n*= 25) patients were prescribed with leukotriene inhibiters, 4.13% (*n*= 6) patients were prescribed with xanthene derivatives, 6.9% (*n*= 10) patients were prescribed with short acting beta agonists, however 4.8% (*n*= 7) patients were prescribed with corticosteroids. The most frequently prescribed therapy was combination drugs observed the Fluticasone+Salmeterol 17% (*n*= 170) while among three drug combinations ICS+LABA'S+LTI'S was prescribed to 10.9% (*n*= 109), and ICS+SABA'S+LTI'S was 3.2% (*n*= 32) as shown in table 4.

Table 4: Prescribing pattern of combination drug therapies.

Prescribing pattern of combination drugs			
Combination therapies	N (%)	N (%)	N (%)
2-Drugs Therapies	Combination-I	Combination-II	Combination-III
ICS+LABA'S	FLT+ SAL= 170 (17%)	BUD+ FORM= 55 (5.5%)	FLUC+ FORM= 76 (7.6%)
ICS+ LTI'S	FLT+ MONT= 90 (9%)	FLT+ ZAF= 23 (2.3)	BUD+ MONT= 42 (4.2%)
ICS+SABA'S	FLT+ ALB= 87 (8.7%**)	FLT+ LEVB= 15 (1.5%)	BUD+ ALBU= 18 (1.8%***)
LABA'S+SABA'S	SAL+ ALB= 65 (6.5%)	SAL+ LEVB= 40 (4.0%)	FORM+ ALBU= 24 (2.4%)
LABA'S+LTI'S	SAL+ MONT= 47 (4.7%***)	FORM+ MONT= 13 (1.3%*)	-
SABA'S+LTI'S	ALB+ MONT= 30 (3.0%*)	LEVAL+MONT= 16 (1.6%)	-
ICS+ Xanthines	FLT+THP = 19 (1.9%)	FLUC+AMINO= 13 (1.3%)	BUD+AMINO= 4 (0.4%*)
3-Drug combination therapy			
ICS+LABA'S+LTI'S	FLT+SAL+MONT= 109 (10.9%*)	BUD+SAL+MONT= 3 (0.3%)	FLT+FORM+ZAF= 3 (0.3%**)
ICS+SABA'S+LTI'S	FLT+ALB+MONT= 32 (3.2%)	FLT+ALB+ZAF= 5 (0.5%)	BUD+ALB+MONT= 1 (0.1%)

*p= 0.001, **p= <0.005, ***p= <0.001, AMINO= aminophylline, BUD= Budesonide, ICS= Inhaled corticosteroids, FLT= Fluticasone, LABA= long acting beta agonists, LEV= Levalbuterol, LTI's= leukotriene receptor antagonists, SABA= short acting beta agonists, SAL= salmeterol.

Discussion

Asthma is a chronic disease around the globe, which requires an appropriate management, according to the demographic detail's asthma was found more prevalent among males i.e.73.5% while 26.5% female suffered from asthma, similar findings were found in a study[14]. The majority of the patients i.e. 46.5% were found in the age range of 12-39 years, 19.8% (n= 198) patients were with age above 40 years which is in accordance to the similar study conducted[15]. The collected data showed the similar results for the residential details that 58.3% patients from urban areas, however 41.7% (n= 417) patients were residing in rural areas, as concluded in a study[16]. Asthma is disease that runs in the families among most cases, 63.1% patients had positive family history with asthma disease, whereas 27.1% patients represented negative family history with asthma that is in accordance with the study conducted in 2017[17]. The study showed majority of patients i.e. 25.3% patients had persistent asthma, according to disease-classification 34.7% patients presented mild intermittent asthma, 24.7% patients were diagnosed with mild persistent asthma, 26.0% patients with moderate persistent asthma, as shown in a similar study[18], while 6.3% patients had severe persistent asthma as found in a study[19]. The management of the asthma was observed with inhaled corticosteroids prescribed to almost more than half of the enrolled patients either monotherapy or combined drugs therapies total of 44.1% medication of class long acting beta agonists to 22.7%patinets,17.2% patients were prescribed with leukotriene inhibiters[20]. The asthma treatment guidelines suggests the prescribing of corticosteroids and long acting beta agonists in combinations (LABA's+ICS) as successful therapy similarly study conducted by Hinds *et al*, 2017 observed as successful therapy In two drug combinations therapies Fluticasone +

Salmeterol was observed as successful therapy similarly[21-23].

Conclusion

This study revealed that, asthma is more prevalent among males' gender, however the two drugs combinations therapies are more frequently prescribed, while the successful combinations are inhaled corticosteroids as add on therapy with long acting beta agonists. the study supports the use of combination therapy in the management of asthma

REFERENCES

1- P. J. Barnes, "Pharmacology of asthma and COPD", ***ERS Handbook of Respiratory Medicine,*** 344 (2019).
2- J. M. Mazurek and G. Syamlal, "Prevalence of asthma, asthma attacks, and emergency department visits for asthma among working adults – National Health Interview Survey, 2011-2016", ***Morbidity and Mortality Weekly Report,*** 67 (13), 377 (2018).
3- L. J. Akinbami, A. E. Simon and L. M. Rossen, "Changing trends in asthma prevalence among children", ***Pediatrics,*** 137 (1), e20152354 (2016).
4- B. Lundbäck, H. Backman, J. Lötvall and E. Rönmark, "Is asthma prevalence still increasing", ***Expert Review of Respiratory Medicine,*** 10 (1), 39-51 (2016).
5- J. A. Lawson, L. M. Chu, D. C. Rennie, L. Hagel, C. P. Karunanayake, P. Pahwa and J. A. Dosman, "Prevalence, risk factors, and clinical outcomes of atopic and nonatopic asthma among rural children", ***Annals of Allergy, Asthma and Immunology,*** 118 (3), 304-310 (2017).
6- American Academy of Pediatrics, "Symptom-based asthma treatment effective in a primary care setting", ***AAP Grand Rounds,*** 42 (6), 63 (2019).
7- S. Faruqi, D. L. Sykes, M. G. Crooks, K. Brindle, J. Thompson and A. H. Morice, "Objective assessment of cough: An early marker of response to biological therapies in asthma", ***Lung,*** 198, 1-4 (2020).
8- T. Katsunuma and K. Akashi, "Treatment and managements of pediatric asthma", ***Nihon Rinsho. Japanese Journal of Clinical Medicine,*** 74 (10), 1741-1746 (2016).
9- C. E. Kuehni and U. Frey, "Age-related differences in perceived asthma control in childhood: Guidelines and reality", ***European Respiratory Journal,*** 20 (4), 880-889 (2002).
10- D. Peloza, M. D. Evans, R. E. Gangnon, J. E. Gern, R. F. Lemanske and D. J. Jackson, "Early life risk factors for asthma at early adulthood", ***Journal of Allergy and Clinical Immunology,*** 143 (2), AB78 (2019).
11- R. Tesse, G. Borrelli, G. Mongelli, V. Mastrorilli and F. Cardinale, "Treating pediatric asthma according guidelines", ***Frontiers in Pediatrics,*** 6, 234 (2018).
12- A. Bush and L. Fleming, "Diagnosis and management of asthma in children", ***BMJ,*** 350, 996 (2015). doi: 10.1136/bmj.h996.
13- P. Ellwood, M. I. Asher, N. E. Billo, K. Bissell, C. Y. Chiang, E. M. Ellwood and N. E. Pearce, "The Global Asthma Network rationale and methods for Phase I global surveillance: Prevalence, severity, management and risk factors", ***European Respiratory Journal,*** 49 (1), 1601-605 (2017).
14- E. I. Bateman, S. S. Hurd, P. J. Barnes, J. Bousquet, J. M. Drazen, M. FitzGerald and E. Pizzichini, "Global strategy for asthma management and prevention: GINA executive summary", ***ibid.,*** 31 (1), 143-178 (2008).
15- O. Fuchs, T. Bahmer, M. Weckmann, A. M. Dittrich, B. Schaub, B. Rösler and H. Watz, "The all age asthma cohort (ALLIANCE) - from early beginnings to chronic disease: A longitudinal cohort study", ***BMC Pulmonary Medicine,*** 18 (1), 140 (2018).
16- G. Bowatte, C. J. Lodge, L. D. Knibbs, A. J. Lowe, B. Erbas, M. Dennekamp and P. S. Thomas, "Traffic-related air pollution exposure is associated with allergic sensitization, asthma, and poor lung function in middle age", ***Journal of Allergy and Clinical Immunology,*** 139 (1), 122-129 (2017).
17- N. Al Ghriwati, M. A. Winter, R. S. Everhart and B. H. Fiese, "Family functioning and child asthma severity: A

bio-behavioral approach", ***Families, Systems, and Health,*** 35 (4), 439 (2017).

18- F. Yavuzyılmaz, Ş. Özdoğan, A. Kaya, P. Karadeniz and M. G. Topkara, "The effect of atopy on asthma severity and asthma control in children with asthma", ***The Medical Bulletin of Sisli Etfal Hospital,*** 51 (1), 56-62 (2017).

19- S. Szefler, J. Antonova, B. Trzaskoma, B. Ortiz, B. Paknis, A. Iqbal and S. Goldstein, "Omalizumab treatment reduces asthma exacerbations in children with moderate or severe persistent Asthma", ***European Respiratory Journal,*** 50 (61), 587-590 (2017).

20- B. A. Chowdhury and G. Dal Pan, "The FDA and safe use of long-acting beta-agonists in the treatment of asthma", ***New England Journal of Medicine,*** 362 (13), 1169-1171 (2010).

21- D. Hinds, K. R. Chapman, P. Piazza, M. Gibbs, C. Raherison, K. Gaalswyk and K. Davis, "Physician perspectives on the burden and management of asthma in Six countries: The global asthma physician survey (GAPS)", ***Pneumologie,*** 71 (S 01), P226 (2017).

22- P. G. Gibson, H. Powell and F. M. Ducharme, "Differential effects of maintenance long-acting β-agonist and inhaled corticosteroid on asthma control and asthma exacerbations", ***Journal of Allergy and Clinical Immunology,*** 119 (2), 344-350 (2007).

23- D. Price, D. West, G. Brusselle, K. Gruffydd-Jones, R. Jones, M. Miravitlles and K. Bichel, "Management of COPD in the UK primary-care setting: An analysis of real-life prescribing patterns", ***International Journal of Chronic Obstructive Pulmonary Disease,*** 9, 889 (2014).

Bull. Pharm. Sci., Assiut University, Vol. 43, Issue 2, 2020, pp. 209-215.

نشرة العلوم الصيدلية
جامعة أسيوط

BULL. PHARM. SCI. Assiut Univ.

نمط وصف الأدوية المضادة للربو لعلاج الربو ، في أماكن مختلفة من كراتشي ، باكستان

سايرا شاهناز

قسم الممارسة الصيدلية ، جامعة ضياء الدين ، كراتشى ، باكستان

مقدمة: الربو هو اضطراب التهابي مزمن شائع في الشعب الهوائية التنفسية مع انتشار متزايد في جميع أنحاء العالم.

الأهداف: تقييم ممارسة الوصف الدوائى الحالية وتحليل الوصفات الطبية للاستخدام الرشيد لعقاقير الربو من خلال المقارنة مع المبادئ التوجيهية الدولية لـــ GINA (المبادرة العالمية للربو).

المنهجية: أجريت دراسة مقطعية بين المرضى الذين لديهم تشخيص مؤكد للربو لمدة ثمانية أشهر فـــي أماكن مختلفة في كراتشي. تم تقييم ملفات الوصفات الطبية وسجلات المرضى لوصف نمط الوصـــفات ونمط المرض.

النتـــائج: خلصت الدراسة إلى أن ٧٣.٥٪ (ن = ٧٣٥) مريض كانوا من الذكور ، بينما ٢٦.٥٪ (ن = ٢٦٥) مريض كانوا من الإناث ، ٤٢٪ (ن = ١٠٥) مرضى كانوا مـــن المرضـــى الـــداخليين فـــي مستشفيات القطاع العام ، ٢٦.٨٪ (ن = ٦٧)) من مستشـــفى القطـــاع الخـــاص و٥٠٪ (ن = ٢٥٠) مريض كانوا من عيادات خاصة ، بينما ٥٨٪ (ن = ١٤٥) كانوا من أقسام العيـــادات الخارجيـــة فـــي مستشفيات القطاع العام. الكورتيكوستيرويدات المستنشقة تم وصفها لأكثر من نصف المرضى المسجلين إما كعلاج وحيد أو علاجات دوائية مشتركة (٤٤.١٪ (ن) = ٦٤) ، تم وصف أدوية من موانـــع بيتـــا طويلة المفعول لـــ ٢٢.٧٪ (ن = ٣٣) من المرضى ، بينما ١٧.٢٪ (ن = ٢٥) مريض تم وصـــفهم بمثبطات الليكوترين.

الخلاصة: تقترح المبادئ التوجيهية لعلاج الربو وصف الكورتيكوستيرويدات ومنبهـــات بيتـــا طويلـــة المفعول معا (LABA's + ICS) والتي لوحظت في الدراسة الحاليـــة كعـــلاج نـــاجح (Fluticasone + Salmeterol).