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INCIDENCE OF DRUG INDUCED CARDIO VASCULAR SYSTEM ADVERSE REACTIONS IN ASTHMATIC PATIENTS – A CLINICAL RETROSPECTIVE ANALYTICAL STUDY

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ABSTRACT

Bronchial asthma is a commonest condition observed in all age groups, whether it's related to occupation or other external influences. Many patients use topical drug delivery methods, for their better pharmacokinetic profile. In the topical method majority of the bronchodilators are used alone and a few in combination with the other systemic anti-inflammatory drugs as a part of general treatment guidelines. This study mainly focused on the possibility of any systemic adverse reactions on cardiovascular parameters like heart rate, BP etc, with the use of bronchodilators, especially like β 2 agonists, anticholinergics and methylxanthines. This study might give an idea to the physician to educate the patients about cardiovascular adverse drug events due to anti asthmatic medications.

Key Words: Bronchodilators -CVS ADR, Topical / systemic drug delivery method.

INTRODUCTION

Respiratory infections and other problems related to the lung are common medical complaints in many individual and can be influenced by seasonal and environmental factors. Drugs used in the obstructive airway disease theoretically can affect cardiovascular parameters such as Blood pressure, changes in cardiac rhythm either direct or indirect action and may cause symptoms like palpitation, edema, or angina and variation in ECG. Recently it was found that fluorocarbon propellant in the commercially available topical inhaler formulation like beta agonist can sensitize the myocardium to toxic effect of catecholamine [1]. Also due to chronicity of this illness, majority of the patients are using this medication for long time which may cause some direct effect on myocardium. In the treatment of airway diseases with topical agents 2-10% of the drug particle (inhaler) goes to the bronchial tree and remaining drug particles

(90%) are swallowed [2]. Majority of the patients are in middle age group (in this study) (Fig-4) and exact percentage of cardio vascular ADR because of the use of these drugs are not known. Hence this study was planned to explore the possibility of ADR on CVS.

Aims & Objective

To identify the cardiovascular side effect of various drugs (hypertension and others) prescribed as a part of treatment in the patients who attended Pulmonology OPD PSG Hospital for about a period of 6 months during the treatment of their illness.

MATERIALS AND METHOD

The list of patients attended the Pulmonology OPD regularly for six months was taken from PSG hospital OPD records during the period of January 2005 to January 2006. Records of these patients were obtained from the medical record department after institutional Human Ethics committee clearance and analyzed specifically for various information's like age of patient, occupation, drugs prescribed and their mode of delivery, any effect on cardiovascular system like HR, BP, Giddiness, fainting

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attack, chest pain, palpitation, nocturnal dyspnea, based on the preformed proforma format.

RESULTS

Total number of cases attended the Pulmonology OPD from January 2005 to January 2006 was 6405 & other details are given in Table-II

DISCUSSION

Number of patients examined in the Pulmonology OPD continuously for period of 6 months was 129. Majority of the people came to Pulmonology OPD suffered from Bronchitis's with asthma, allergic Bronchitis's, Bronchiectasis, Tuberculosis of lung & majority of them were males between the age group 40-50 years and most of their prescriptions had bronchodilators, steroids, anti-allergic drugs like leukotriene antagonist, mast cell stabilizers.

112 cases had been prescribed with bronchodilators, out of which 83% were with β -agonist and 53% anticholinergics and 36% prescription had Phosphodiesterase inhibitors like Theophylline Deriphylline and Aminophylline (Fig 2). The second major drug prescribed was steroids. 90 cases had been prescribed with steroids out of 90 patients 63% had been prescribed with topical (inhaler and Nebulizer) Steroid preparation, 9% with IV Hydrocortisone and 28% cases with oral prednisolone (fig 5). The third major drug prescribed was anti-allergic & majority of prescriptions had both oral formulation III generation antihistaminic like Loratidine, Cetirizine, Fexofenadine & topical preparations like sodium Cromoglycate and Azelastine (Fig 3). Blood Pressure variation was checked in these patients showed no significant fall or elevation from the

basal recording. But it was also noted that, a small fall in BP recording 6-10 mmHg in both systolic and diastolic pressure in individuals on short acting β_2 agonist (fig - 6) & no changes on Heart rate, ECG [3]. It was also found with patients on hypertensive medications & β_2 - agonist, Sulphonylurea with β_2 - agonist as a small fall in BP (2-10mmHg) (Fig -6) [4]. All the case records of the patients who visited the Pulmonology OPD had normal CVS parameter at the time of first visit, the same patients were checked for ADR on Cardio vascular changes like changes BP (high or low), tachycardia, tacharrhythmia etc, during each visit did not show any changes in the cardiac parameters except tachycardia and palpitation during acute exacerbation on chronic asthma.

SUMMARY

This may or may not be a significant finding in this case sheet study since only 2% of the cases had been attended the OPD regularly as a part of treatment. It may require further follow up in these patients for β_2 - agonist, anti-hypertensive medications like Nifedipine, Propranolol, Amlodipine, ACE Inhibitors, anti-diabetic drugs Glybenclamide, Glimepride, Metformin to understand the drug interaction [4]. Reduction in BP to 2-10 mm Hg was observed in patients known for HT, DM on regular drugs with beta 2 agonists, explained the synergism as A) Vasodilator + Respiratory drug \rightarrow reduction in BP due to smooth muscle relaxation. B) Sulphonylurea + respiratory drug \rightarrow reduction in BP due to alteration of potassium channels. As a bronchodilator only oral/ inhaler β_2 - agonist showed reduction in BP (2-10mmHg) both systolic and diastolic pressure in individuals treated only with Salbutamol, but not with long acting β_2 - agonist.

RESULTS

I. Total No of cases attended Pulmonology OPD during the year 2005 Jan to 2006 January: **6405**

II. No of cases attended continuously more than 6 months: **129**

A. Male: 67 Female: 62

B. Age in years

0-10 = 8	20-30 = 12	40-50 = 31	60-70 = 21	80-90 = 2
10-20 = 7	30-40 = 7	50-60 = 29	70-80 = 11	90-100 = nil

C. Occupation:

Self employment 12	Factory worker 8	Daily wages 14	Others * * 95
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D. Mode of drug delivery

Oral	Topical 18			Combined
30%	Inhaler / Spacer 12%	Nebulizer 2%	House 02 Nil	56%

E. List of drugs seen in the prescription

Anti inflammatory	0
Steroids	90
Bronco dilators	112
Anti allergic / Anti histamines	80
AMA	81
*Others	78
TB	14
CA drugs	0
Immunosuppresant	Nil

* (DM, HT, CVS & Epilepsy drugs)

** (House wife, unemployed, student)

F. Number of patients with Bronchodilators alone or a combination

B2 agonist	Anti cholinergic	PDEI
89%	53%	36%

G. Number of patients with steroids therapy

Hydrocortisone	Prednisolone	Topical steroids
9%	28%	63%

H. Number of patients with anti allergic drug therapy

LT Antagonist	H1 antagonist	Sodium cromoglycate	Azelastine
80%	74%	8%	6%

I. No cases shown changes in CVS parameters

Parameters	Number of patients
BP Variation	60
ECG	Nil
Angina	Nil
Palpitation	Nil
Edema	Nil
Non specific ADR	Nil

J. BP variation in patients (60 / 112)

B2 agonist	B2 agonist + anti hypertensive	B2 agonist + antihypertensive + anti diabetic drugs
70%	20%	10%

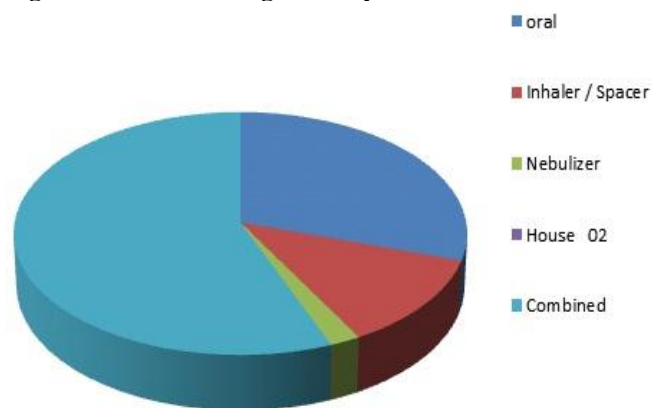
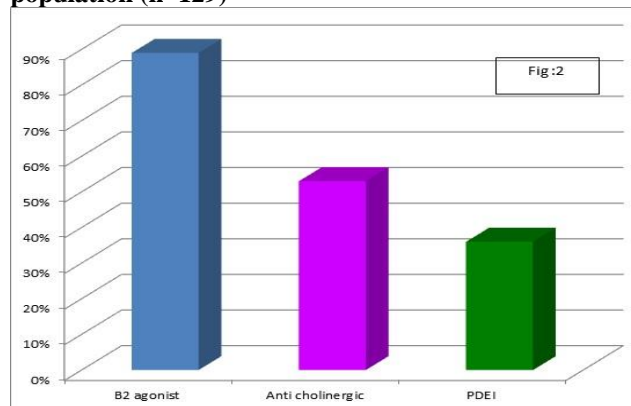
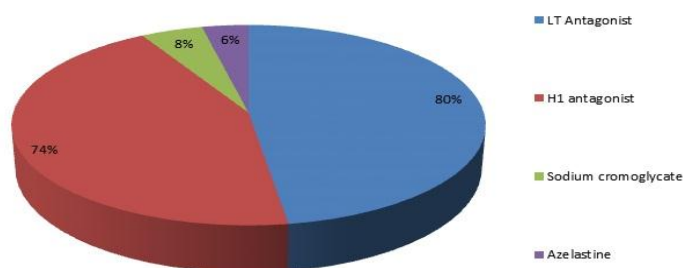
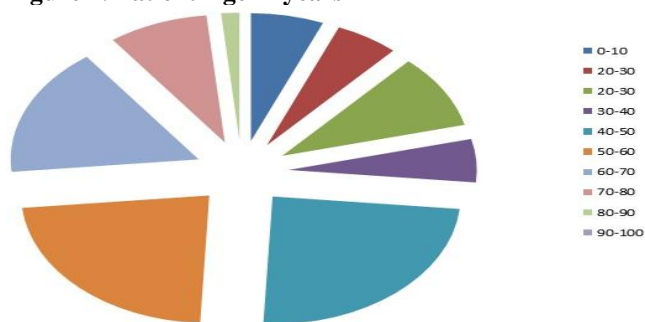
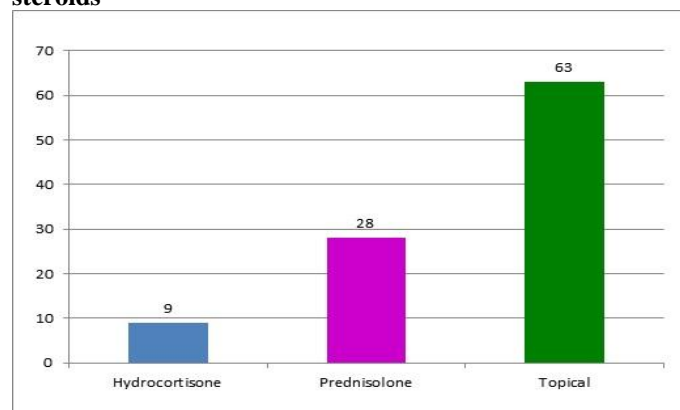
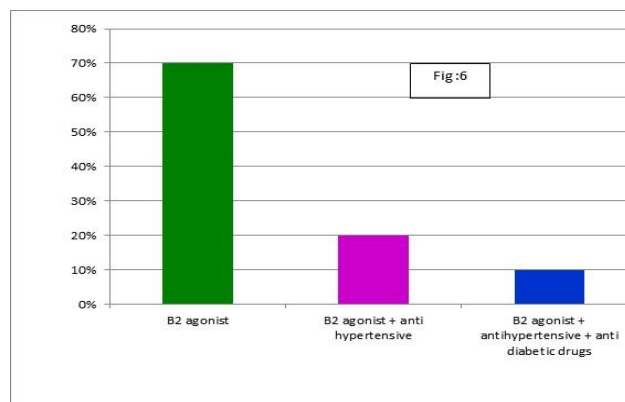
Figure 1. Mode of Drug Delivery**Figure 2.% of Bronchodilators used in the study population (n=129)**

Figure 3. Numbers of Patients with anti allergic drugs (n=129)**Figure 4. Patient Age in years****Figure 5. % of Patients treated with topical/ systemic steroids****Figure 6. % Reduction in BP(N=60)**

CONCLUSION

In this study, patients who were attended Pulmonology OPD for more than 6 months duration regularly reviewed for their respiratory illness showed no serious ADR cardiovascular system even though the patient were prescribed with steroids and other anti-asthmatic drugs which can influences the cardio vascular function through different dimension.

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