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**INDO AMERICAN JOURNAL OF  
PHARMACEUTICAL SCIENCES**Available online at: <http://www.iajps.com>**Research Article****DRUG RELATED PROBLEMS ASSOCIATED WITH  
MEDICATIONS USED IN ASTHMA****Kousalya Prabahar\*<sup>1</sup>, Praveen D<sup>2</sup>**

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**Abstract:**

**Aim:** The main aim of this study is to find out the drug related problems (DRP) associated with the medications used in the management of Asthma.

**Methodology:** This prospective observational study was carried out in inpatient department of pulmonology in a tertiary care hospital. Patient history/medication interview was done. Other criteria to assess the appropriateness of drug related problems was based on BNF, GINA guidelines and modified Beer's criteria.

**Results:** Among the study population of 84 individuals, 36% suffered from other comorbid conditions with asthma, and 48% were affected only with asthma. Total numbers of DRPs were 104, in that polypharmacy - 25%, contraindications - 16%, drug interactions - 22%, overdose - 15%, underdose - 3% and ADR were found to be 19%.

**Conclusion:** This study shows that DRP occur frequently in patients using several drugs to treat chronic diseases. The number of DRP was also significantly associated with the number of drugs prescribed. Moreover, patients with polypharmacy had significantly more drug related problems.

**Key Words:** Asthma, Prescriptions, Drug related Problems

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**INTRODUCTION:**

Asthma is well-defined as a chronic inflammatory disorder of the airways, characterized by recurring episodes of wheezing, dyspnoea, chest tightness and cough that is frequently revocable, either spontaneously or with treatment [1]. Different terms such as allergic or asthmatic bronchitis, wheezy bronchitis, intrinsic and extrinsic asthma are frequently employed in clinical practice [2].

A drug-therapy related problem (DRP) can be defined as an event or circumstance involving drug treatment that actually or potentially interferes with the patient experiencing an optimum outcome of medical care [3,4]. Drug-related problems are common in the elderly and include drug ineffectiveness, adverse drug effects, over dosage, under dosage, and drug interactions [5].

Drugs may be ineffective in the elderly because clinicians underprescribe (eg, because of increased concern about adverse effects) or because adherence is poor (eg, because of financial or cognitive limitations) [6-9].

The main aim of this study is find out the drug related problems (DRP) associated with the medications used in the management of Asthma. The secondary objectives are resolving medication problems by pharmacist intervention and providing patient counseling for better medication adherence.

**MATERIALS AND METHODS:**

This prospective observational study was carried out in inpatient department of pulmonology in a tertiary

care hospital. Patients with the age of >18 years, diagnosed with asthma and who provided informed consent for this study were included. Pregnant and psychiatric patients, patients with respiratory co-morbid conditions like Chronic Obstructive Pulmonary Disease were excluded from the study. Based on the inclusion and exclusion criteria, 84 patients were selected for the study.

**Data Collection**

A specially designed proforma was used for data collection. Inpatient case sheets were documented in the case documentation form. Patient history/medication interview was done. Other criterion to assess the appropriateness of drug therapy was based on BNF, GINA guidelines and modified Beer's criteria.

**Data Analysis**

Descriptive statistical analysis was performed using (SPSS) version 19. Categorical variables were described by frequencies and percentages, and continuous variables were described by means and standard deviations.

**RESULTS:**

Drug data and patient characteristic data were computed using MS excel. Among the study population of 84, majority of patients diagnosed with asthma were in the age group of 36-45 (Table 1).

**Table 1: Age distribution of patients**

Age	No of patients	Percentage
25-35	16	19%
36-45	25	30%
46-55	24	28%
56-65	19	23%

**Table 2: Drug related problems**

Drug related problems	Total
Polypharmacy	26
Contra indications	17
Drug interactions	20
Over dose	14
Under dose	3
ADR	20

**Table 3: Gender distribution of patients with polypharmacy and without polypharmacy.**

Gender	With polypharmacy	Without polypharmacy	p value
Male	11	3	0.0277*
Female	15	21	

\*p < 0.05 is statistically significant.

**Table 4: Comparison of DRPs using ANOVA**

Model	R	R square	Adjusted r square	Std. Error of the estimate
1	0.833 <sup>a</sup>	0.693	0.687	0.959
2	0.902 <sup>b</sup>	0.813	0.805	0.757
3	0.920 <sup>c</sup>	0.846	0.836	0.695
4	0.938 <sup>d</sup>	0.879	0.869	0.621
5	0.943 <sup>e</sup>	0.890	0.877	0.601

A. Predictors: (constant), drug interactions

B. Predictors: (constant), drug interactions, age

C. Predictors: (constant), drug interactions, age, overdose

D. Predictors: (constant), drug interactions, age, overdose, polypharmacy

E. Predictors: (constant), drug interactions, age, overdose, polypharmacy, contraindication

In the study population, 51% were male and 49% were female. Among the study population of 84 individuals, 36% suffered from other comorbid conditions with asthma, and 48% were affected only with asthma.

There were 104 DRPs observed in the study population. Among them, 25% were polypharmacy, 16% were contraindications, 22% were drug interactions, overdose observed was 15%, underdose 3% and ADR was found to be 19% (Table 2). DRPs were found mostly in the elderly people compared to adults.

Polypharmacy was found in 26 prescriptions. When we compare polypharmacy prescription with normal prescription, there was a statistically significant difference found among male and female and the prescription with and without polypharmacy (Table 3).

Statistical analysis was done using ANOVA. Drug interactions, age, overdose, polypharmacy, contraindication were all compared and none of them showed a statistically significant difference (Table 4).

### DISCUSSION:

Elderly people were found to have more incidences of DRPs than adults which is similar to the study conducted by Nazerth et al [10]. Among the study

population of 84 individuals, 36% suffered from other comorbid conditions with asthma, and 48% were affected only with asthma. Several studies provided similar reports [11-13].

Intervention was done in 47% of the study population. Remaining people were recently diagnosed and without medication errors where intervention was not needed. In males, known case of asthma was found in 17 (39%) and newly diagnosed in 36 (61%). In females, known cases are found in 20 (51%) and newly diagnosed in 16 (49%).

Prescriber-related DRP was most commonly detected by conducting the structured medication review:

- ✓ no drug prescribed but clear indication,
- ✓ unnecessarily long duration of treatment,
- ✓ dose of drug used being too low, and
- ✓ Drug-drug interactions.
- ✓ Side effects and lack of knowledge about the drugs were the most common DRP identified by patient interview.

Prescription of drugs from hospital using five or more drugs for treatment of chronic asthma is associated with drug related problems. Previous study also proves the same [14]. As confirmed by the results of the present study, the number of medication errors increases with the number of drugs prescribed. Particularly in the patient group included in the present study, occurrence of drug related problems may result in increased risk of hospital readmission, morbidity, mortality, and health care costs [15,16].

**CONCLUSION:**

This study shows that DRP occur frequently in patients using several drugs to treat chronic diseases. The number of DRP was also significantly associated with the number of drugs prescribed. Moreover, patients with polypharmacy had significantly more drug related problems. Patients discharged from the department of pulmonary diseases also had more DRP than those discharged from other departments.

An important task for community pharmacists is to identify, resolve, and prevent the occurrence of drug related problems in this group of patients which, in the coming years, is expected to grow considerably in size. Using comprehensive tools to identify drug related problems, it is very important to develop intervention strategies to achieve this goal.

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