



## ANALYSIS OF PRESCRIPTION PATTERN AND DRUG UTILIZATION IN ASTHMA THERAPY

Patel Pinal D.\*<sup>1</sup>, Patel R.K.<sup>2</sup>, Patel N.J.<sup>3</sup>

<sup>1</sup>Department of Pharmacology, Aksharpreet institute of Pharmacy, Jamnagar, Gujarat, India

<sup>2</sup>Department of Pharmacognosy, S.K. Patel College of Pharmaceutical Education and Research, Ganpat University, Gujarat, India

<sup>3</sup>Department of Pharmacology, S.K. Patel College of Pharmaceutical Education and Research, Ganpat University, Gujarat, India

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\*Email: pinalpatel\_pharma1983@yahoo.co.in

### ABSTRACT

This drug utilization or prescription-monitoring study was conducted to evaluate the drug-prescribing trend of anti-asthmatic drugs in retail pharmacy outlets during 2009 and 2011 in urban and rural area of Saurashtra region, Gujarat, India. The study was conducted on 601 patients, using a developed prescription auditing Performa. Data was recorded from the co-operating patients by interviewing and information was filled in the performa. The data suggested that punctuality in professionalism like mentioning own (physicians) name, patients name, diagnosis and minimum qualification of MD/MS was observed to be higher in urban than the rural. There was no significant sex difference. Bronchial asthma was found to be more prevalent in the age group 41 to 60 years. Patients were found to consult the doctor 2 to 7 days after symptoms and pay consulting fee more than Rs.20=00. The collected information suggested that bronchodilators were the most frequently prescribed anti-asthmatic drugs followed by corticosteroids and methylxanthine preparation. Analysis of prescription revealed that multiple drug therapy was opted for a significant number of patients as compared to single drug therapy. In combination therapy, the three-drug combination was the most often prescribed. Number of partial purchase of drugs as per the prescriptions was found to be higher in rural area than urban area. Lack of money was one of the reasons for partial prescription. Thus, it can be concluded that the present prescribing pattern of antiasthmatics in Saurashtra region does not completely meet standard guidelines for the asthma treatment. Hence there is a need of awareness amongst the physicians of Saurashtra region so that they can follow the guidelines while treating asthma. Also the patients must be encouraged to complete whole treatment for improving the health. It has been also concluded that a study may be more meaningful to further improve the dispensing practices of the pharmacist.

**Keywords:** Asthma, Prescription-monitoring, Drug utilization study, Anti-asthmatic drugs

### INTRODUCTION

Asthma is a chronic inflammatory disorder of the airways. Asthma is thought to affect about 3% of the population in most countries.<sup>1</sup> Asthma creates a substantial burden on individuals and families as it is more often under-diagnosed and under-treated.<sup>2</sup> In India, it was seen as one of the leading cause of morbidity and mortality in rural India.<sup>3</sup> In India three to five per cent pediatric population is affected by asthma whereas in adults the prevalence range from 3-11%.<sup>4</sup> Though effective screening, evaluation, and management strategies for Asthma have not been fully implemented in India.<sup>5</sup> Long-term treatment is generally required for an effective management, which has an effect on the cost of the therapy and patient's compliance.<sup>6</sup> Here, an attempt has been made to identify the attitudes of physicians and patients towards pharmacological and nonpharmacological approaches in the management of asthma. The study highlights the lacunae in the current prescribing practices and the role of pharmacists in improving patients' health and in optimizing the costs of drug regimens. The study was conducted in randomly selected urban and rural areas of Saurashtra region of Gujarat, India, between the years 2009 and 2011. A subset of 601 patients was randomly selected for a survey using the specially prepared questionnaires. Drug utilization audits are qualitative assurance programs to ensure that drugs are used correctly and safely. The nature of such audits can be quantitative or qualitative or combination of both. Quantitative audits are concerned with quantifying various facts of drug therapy use within a health care system area group whereas qualitative audits compare drug use or practice with predetermined standards or criteria.<sup>7</sup> The present study aimed to assess drug utilization in asthma

therapy as a quantitative type of prescription auditing to generate data with respect to their extent variability of drug usage in a health care system of a particular criteria.

### MATERIALS AND METHODS

The study was conducted by using structured questionnaires targeting the asthmatic patients during 2009 and 2011 in urban and rural area of Saurashtra region, Gujarat, India. Questions were explored the social and economical demographic variables, current prescription trends and use of anti asthmatic drugs. The study was done in retail pharmacy outlets spread over the Saurashtra. Out of these retail outlets, it was decided to study 5-10% retail pharmacy outlets in isolated area nearby to the bus / railway station, nursing home, government hospitals and reasonably populated residential area. We also considered geography of that particular cities or town. Selected retail pharmacy outlets covered all types of population of cities as well as nearby areas. These zones were occupied not only by hut dwellers but also high-income populations and industrial workers. Data regarding doctor's prescription were collected with the help of qualified pharmacists who was apprised of the survey procedures and the objectives of the study using specially prepared and pre-tested questionnaires.

Patients who visited pharmacy outlets to purchase drugs were individually interviewed using the prepared questionnaire for this study after their visit to the doctor. Verbal consent was taken from every patient before enrolling in this study. The patients who co-operated were interviewed and information was filled in Performa. The study variables in the study were - age, sex, clinical diagnosis, anti- asthmatics prescribed, single/multiple drug therapy, name and cost of anti-asthmatics. Their socio-economic status was also asked as

mentioned in the patients' information. Patients were individually interviewed about the nature and duration of their symptoms and if purchased partially, then reason for partial prescription. In the case of prescription bearing patients, the appropriateness of the drugs prescribed was evaluated based on information given in the prescription. This was an observational study aimed at identifying the current practice with anti-asthmatic prescription. So, the number of drugs per prescription was observed.

Only asthmatic patients were included in the study; asthmatic patients who suffered from other diseases, such as hypertension and heart problems, and other co-morbidities such as peptic ulcer, diabetes mellitus, and migraine, were excluded from the study. Also, patients suffering from acute bronchitis, chronic bronchitis, chronic obstructive pulmonary disease (COPD), and community-acquired pneumonias were also excluded.

## RESULTS

During the study, 601 (250 Rural and 351 Urban) prescriptions were included for data analysis as per the inclusion and exclusion criteria. Demographic analysis of data revealed that there were punctuality in professionalism like mentioning own (physicians) name, patients name and diagnosis on the prescription observed to be higher in urban than the rural area (Table 1). Physician with a minimum qualification of MD/MS was also higher in urban area and their consulting fee was more than Rs.70=00 (Table 1). Patients were found to consult MBBS doctors in urban area paying a fee of Rs. 35 to 50 while in rural area fee was Rs.30-40. In rural area non MBBS doctors consulting fee is Rs.20-30. The fee charged by physician in rural and urban areas was significantly different from each other (Table 1).

There was no significant difference between the drug purchased from males (48%) and females (40%) in urban and rural area. Age wise distribution of patients was not significantly different between rural and urban population. Majority of the patients were in the age group of 21-60 years (Table 2).

Patients were found to consult the doctor, in rural area they were found to visit more after 2 to 3 days (34%) of illness, while in urban area they were found to visit after 4 to 7 days (43%) of illness. Number of partial purchase of drugs as per the prescriptions was found to be higher in rural area than urban area. Lack of money was one of the reasons for partial prescription. Rest of reasons play some role for the partial prescriptions shown in table 3.

The percentages of the patients who received either monotherapy or combination therapy, i.e., two, three, four, or five drug regimens, showed that 16% of all the patients were treated with a single anti-asthmatic drug and 84% of the patients were treated with anti-asthmatic drug combinations table 4. In multiple drug therapy, two-drug combinations were as more widely prescribed than combinations of three/four drugs in rural area than urban area table 4.

The pattern of drug prescription in asthmatics showed the highest prevalence of  $\beta_2$ agonist followed by corticosteroids and methylxanthine table 5. Antibiotics and antitussive preparation was found to be prescribed table 5.

## DISCUSSION AND CONCLUSION

Irrational use of drug and inappropriate prescribing are the two common phenomenons in the developing countries which cause a big problem for providing effective health care facilities.<sup>6</sup> Rational use of drug requires that patient receive medications appropriate to their clinical needs in doses that meet their own requirements for adequate period of time and

cost effective.<sup>8</sup> Thus, there is need for pharmacotherapeutical studies. However, only a few studies have been conducted because of several constraints in India. A prescription-based survey is considered one of the scientific methods to assess and evaluate the rationality of the prescription. Now, recommendations of various international bodies on asthma which help improve prescribing practices of the physicians and ultimate clinical standard are available.<sup>9,10,11</sup> Pharmacotherapeutical studies of asthma in saurashtra region of Gujarat revealed that punctuality in professionalism like mentioning own (Physicians) name, patient's name and written provisional diagnosis was mentioned higher in urban areas than rural areas by all doctors. These may due to higher qualified doctors as compared to non MBBS doctors in urban area. Analysis of 601 cases of asthmatics, in this study, revealed that there was no significant difference between males and females in rural and urban area. More number of rural patients visited after 2 to 3 days of illness while more number of people from urban area preferred to visit doctors after 4 to 7 days of illness. This indicates that urban people initially might be taking self medication. The reason for self medication may be higher fee charges in urban area than rural area.

Asthma usually requires continuous medical care. Patients with moderate to severe asthma have to take long term medication daily to control the underlying inflammation and prevent symptoms and attacks.<sup>12</sup> But it was found that all patients did not purchase all prescribed medicines. Partial purchase of prescribed drugs was higher in patients from rural than urban area. Low literacy rate in rural area may be one of the reasons for this. Lack of money was the main reason for partial prescription in both rural and urban area.

Since asthma patients often require more than one drug for control of symptoms hence combination are required to treat asthma. In this study 84% patients were on multiple drug therapy and only 16% patients were on single drug therapy. This indicated the awareness among prescribers. Number of categories of drugs prescribed by doctors was found to be three or more than three drugs in urban as compared to rural because in rural area MBBS and non MBBS doctors also gives some medicine from their dispensaries.

Overall drug utilization patterns showed that  $\beta_2$ agonist were the drugs of choice for asthmatic patients, findings that were in agreement with those reported by Kumar et al.<sup>13</sup> Specific  $\beta_2$  agonists and methylxanthine derivatives or their combination are most commonly used by majority of asthmatic patients from mild to severe asthma in the tablet form probably due to their lower cost. Combination with  $\beta_2$ -agonist is more effective than either agent alone used. The use of corticosteroids was found to be through monotherapy and combination therapy. However, potential adverse effects associated with corticosteroids restricted their use as compared to  $\beta_2$  agonists. This indicated awareness among prescribers.<sup>14</sup> When antibiotics, expectorants and anti-tussive are less prescribed compared to asthma controllers, it suggests awareness among physicians towards the standard treatment guidelines.

The inhalational route causes a high local delivery therapy hence will improve the therapeutic ratio and minimize systemic side effects. According to treatment guidelines inhalational therapy for asthma should be the first choice. Therefore, it is suggested that physicians prescribe inhalers more than tablets. However, this will require more of patient's education and convincing by the treating physician for inhalational therapy.

This study concluded that the present prescribing practice in asthma therapy in saurashtra is not sufficiently rational. Based on these base line data and lacunae, in the present prescribing practice, an intervention was suggested to improve the current prescribing trend for better and rational utilization of drugs. There is need to encourage physicians to follow asthma guidelines while managing asthmatic patients. We recommend that these practitioners can be used as facilitators in future training programs for general practitioners, family physicians and primary care physicians. National Asthma Education Program will be beneficial as an initial step, in improving asthma knowledge and increasing awareness in the medical community, on current therapy.

It was also noticed that pharmacists usually distributed medicines without giving any written or detailed oral instructions. Thus, our study highlights the lacunae in the dispensing trends and help to improve the dispensing practices of pharmacists through successful implementation of interventional programs in health care centers.

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**Table 1: Demographic analysis of physician professionalism**

|            | Mentioning physicians name | Mentioning patients name | Mentioning diagnosis | Physician qualification and fee charges |                      |                      |
|------------|----------------------------|--------------------------|----------------------|---|----------------------|----------------------|
|            |                            |                          |                      | MBBS                                    | MD/MS                | Non MBBS             |
| Urban area | 97.7%                      | 91.7%                    | 58.4%                | 52.4%<br>(Rs. 35-50)                    | 16.5%<br>(Rs. >= 70) | 23.6%<br>(Rs. 25-40) |
| Rural area | 90.4%                      | 84.4%                    | 49.6%                | 34.8%<br>(Rs. 30-40)                    | 8.4%<br>(Rs. >= 50)  | 54.8%<br>(Rs. 20-30) |

**Table 2: Demographic distribution of asthmatic patients**

| Age groups (yrs) | Male               |                    | Female             |                   | Total              |                    |
|------------------|--------------------|--------------------|--------------------|-------------------|--------------------|--------------------|
|                  | Urban area (n=207) | Rural area (n=153) | Urban area (n=144) | Rural area (n=97) | Urban area (n=351) | Rural area (n=250) |
| <= 20            | 37 (18)            | 26 (17)            | 24 (17)            | 18 (18)           | 61 (17)            | 44 (17)            |
| 21-40            | 67 (32)            | 51 (33)            | 47 (37)            | 31 (31)           | 114 (32)           | 82 (33)            |
| 41-60            | 63 (30)            | 53 (35)            | 45 (31)            | 34 (35)           | 108 (31)           | 87 (35)            |
| 61-80            | 35 (17)            | 21 (14)            | 24(17)             | 12 (12)           | 59 (17)            | 33 (13)            |
| >= 81            | 5 (2)              | 2 (1)              | 4 (3)              | 2 (2)             | 9 (2)              | 4 (2)              |

Value indicated in ( ) are in percentage.

**Table 3: Reason for partial prescription**

| Reason                             | Rural area | Urban area |
|------------------------------------|------------|------------|
| 1) Lack of money                   | 77.4%      | 68%        |
| 2) All drugs aren't necessary      | 4.3%       | 10.6%      |
| 3) Drugs are not available         | 10.7%      | 4%         |
| 4) Drugs received from doctor      | 13.9%      | 12%        |
| 5) Preliminary therapeutic testing | 7.5%       | 9.3%       |
| 6) Drugs available at home         | 10.7%      | 13.3%      |

**Table 4: Drug therapy regimen (single/multiple drug regimen)**

| Drug therapy | Number of patients |            |
|--------------|--------------------|------------|
|              | Urban area         | Rural area |
| Single drug  | 13 (4)             | 19 (8)     |
| Two drug     | 67 (19)            | 122 (48)   |
| Three drug   | 156 (44)           | 70 (28)    |
| >= Four drug | 115 (33)           | 39(16)     |

Value indicated in ( ) are in percentage

**Table 5: Drugs primarily used in Saurashtra region for asthma**

| Category                | Name of the drugs   | Drugs utilization |            |
|-------------------------|---|-------------------|------------|
|                         |   | Urban area        | Rural area |
| <b>β agonist</b>        | Salbutamol, Terbutalin, Salmeterol, Formeterol                        | 317 (90)          | 209 (84)   |
| <b>Corticosteroids</b>  | Beclomethasone, Budesonide, Fluticasone, Hydrocortisone, Prednisolone | 194 (55)          | 103(41)    |
| <b>Methylxanthine</b>   | Theophylline, Etophylline   | 137 (39)          | 97 (39)    |
| <b>Antibiotics</b>      | Tetracycline, Floroquinolone  | 113 (32)          | 90 (36)    |
| <b>Antitussive</b>      | Mucolytics, Cough suppressant   | 157 (48)          | 98 (39)    |
| <b>Antihistaminics</b>  | Chlorphenaramine, Loratidine, Cetirizine                              | 47 (13)           | 52 (21)    |
| <b>Anticholinergics</b> | Ipratropium bromide   | 42 (12)           | 29 (12)    |

Value indicated in ( ) are in percentage

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