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Prevalence and Drug Utilization Evaluation of Seasonal Allergic Patients



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ABSTRACT

The study was designed in such a way to evaluate the prevalence and drug utilization among seasonal allergic patients in different hospitals and private clinics of Dehradun, Uttarakhand. A total of 400 prescriptions of seasonal allergic patients were chosen during the period of study. Gender-wise distribution of seasonal allergic patients was more in male patients as compared to female patients. Age-wise distribution was found to be higher in male patients than female patients and among all age groups, the distribution of seasonal allergic patients was highest in the age group of 21-40 years while lowest in age group >80 years. The study revealed significant differences among socioeconomic groups, with a high frequency of allergic conditions in people with low income level. Maximum numbers of prescriptions include three drugs per prescription and there was predictably low incidence of polypharmacy on the basis of prescriptions with five drugs per prescription. For the treatment of seasonal allergic patients, some drug categories were commonly prescribed by the physicians including antibiotics, steroids and anti-allergic drugs. Among anti-allergic medications, commonly available drugs categories were antihistaminics, steroids, antileukotrienes and decongestants while most frequently prescribed drugs were levocetirizine, dexamethasone, montelukast and prednisolone. Steroids were the most frequently prescribed drug category in mono-therapy, anti-histamines in two-drug combination therapy and antileukotrienes in three or more drug combination therapy. The study finally concluded that there was a remarked prevalence of seasonal allergic patients due to risk factors like age, gender, life style, environment, food habits, social habits etc. This study reflected the actual utilization of medications in allergy patients and patient counseling needs to be encouraged to overcome the ever-rising problem of non-compliance in them.

INTRODUCTION

Allergy is one of the most sporadic diseases in today's world. More than 25% of the population in industrialized countries suffers from allergies. According to the asthma and allergic foundation of America, allergies are the sixth leading cause of chronic diseases in United States and the annual cost incurred in dealing with them is estimated at \$18 billion.¹ An allergy is a hypersensitivity disorder of the immune system involves systemic inflammatory phenomenon leading to other diseases that affect various tissues or body organs, resulting especially in diseases such as atopic dermatitis, allergic rhinitis, asthma, food allergy etc.

Allergic reactions takes place when a person's immune system reacts to normally harmless substances in the environment. These reactions are acquired, predictable and rapid. Allergy is one of four forms of hypersensitivity and is known as type I (or immediate) hypersensitivity. Allergic reactions are discreet because of too much activation of certain white blood cells called mast cells and basophils by a type of antibody called immunoglobulin E (IgE). This reaction causes an inflammatory response which can range from uncomfortable to dangerous.^{2,3}

Seasonal allergy is commonly called as hay fever. It is caused by airborne pollens from trees, grasses, flowers and weeds. They occur only during certain seasons particularly the spring, summer, or fall depending on what a person is allergic to. Allergy season typically dominates in the spring and fall when certain trees or grasses pollinate. Symptoms involve primarily the membrane lining the nose, causing allergic rhinitis, or the membrane lining the eyelids and covering the whites of the eyes (conjunctiva), causing allergic conjunctivitis. Seasonal allergies cause from exposure to airborne substances (such as pollens) that appear only during certain times of the year. Seasonal allergies cause itchy skin, a runny nose, watery and bloodshot eyes and sneezing.^{4,5}

Drug utilization research is defined as the marketing, prescription, distribution and use of drug in a society with importance given to resulting medical, social and economic consequences. The main importance of drug utilization research is to ease intellectual use of drugs in population.⁶⁻⁸

This study was aimed to evaluate the prevalence and drug utilization among seasonal allergy patients. The main objectives of the study include:

- To collect data from patients using a questionnaire format as well as from prescription.
- To evaluate the prevalence of seasonal allergic patients including:
 - Demographic profile of patients
 - Symptomatic categorization of seasonal allergic patients
- To evaluate the drug utilization in seasonal allergic patients based on prescription analysis:
 - Types of medications prescribed
 - Most frequently prescribed medication
 - Most commonly used dosage forms
 - Average number of drugs per prescription
 - Highest and lowest number of drugs per prescription
 - Degree of polypharmacy

METHODOLOGY

The study was carried out on those out-patients in different hospitals and private clinics of Dehradun, Uttarakhand. All the necessary and relevant information was collected from out-patient prescriptions, laboratory data reports and verbal communication with patients. Prescriptions from patients who were diagnosed with seasonal allergy were selected for the study and data was collected from patients using a questionnaire format. This prospective cross-sectional study was undertaken between February 2015 and August 2015.

RESULTS & DISCUSSION

Demographic Profile:

Demographic profile includes patient's related parameters such as age, gender, literacy status, living status, social habits, economic status etc. While studying about the gender wise distribution of patient, it was found that there was more number of male patients as compared to female patients (Figure 1).

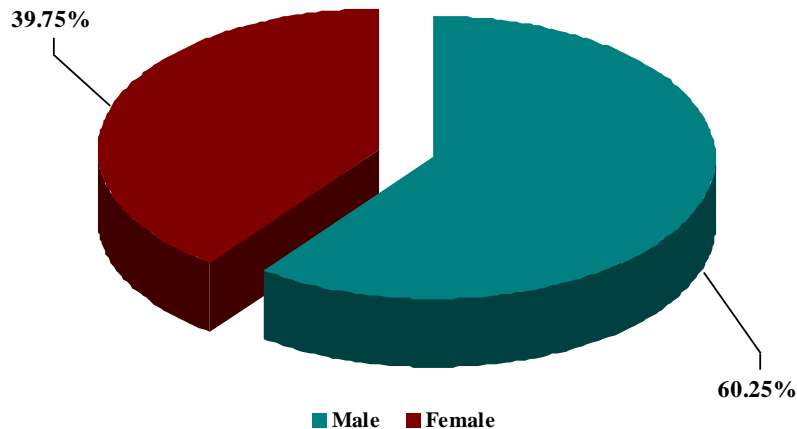


Figure 1. Gender-wise distribution of patients

Out of 400 patients, 83 (20.75%) patients were from age group of 0-20 years, 128 (32%) patients were from age group of 21-40 years, 86 (21.5%) patients were from age group of 41-60 years, 66 (16.5%) patients were from age group of 61-80 years, 38 (9.5%) patients were from age group >80 years. It was observed that age-wise distribution was found to be higher in male patients than female patients among all age groups. Among all age groups, the distribution of seasonal allergic patients was highest in the age group of 21-40 years while lowest in age group >80 years. The reason may be the exposure to foreign substances as allergens by such age group individuals in outer surroundings like offices, markets, shops, travels etc. and chances of developing allergic conditions were more prone to them easily as well as regularly.

Patients were categorized into three socioeconomic classes: Lower class, middle class and upper class. Patient those having monthly income less the Rs. 8000/- were considered in the lower class, patient those have monthly income between Rs. 8000/- to Rs. 16000/- were considered as middle class and patient have monthly income more than Rs. 16000/- were considered as upper class. The study revealed significant differences among socioeconomic groups, with a high frequency of allergic conditions in people with low income level. The greater number of patients belonged to lower class as compared to middle and upper class (Figure 2). The major reasons for that might be the differences in the life style, sanitation conditions and food habits as because of differences in monthly family budget depending on their class. Other reasons may include their nature of job, stressful life and physical inactivity.

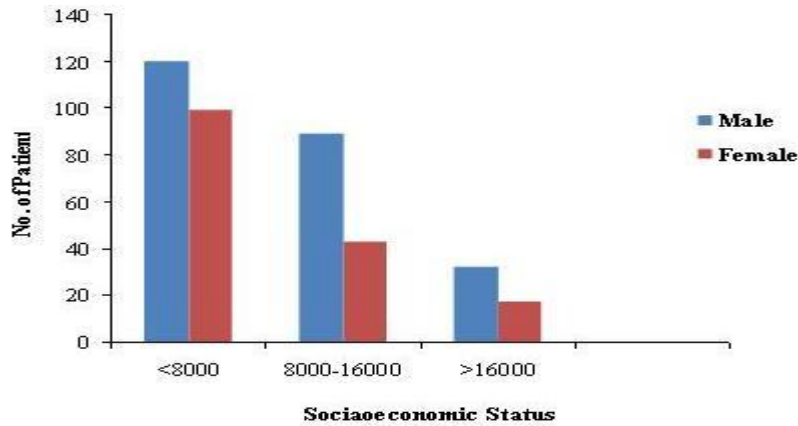


Figure 2. Distribution of patients according to social economic status

Social habits are generally been described as the type of food, alcohol intake and smoking habit. From Table 1, it was observed that non-vegetarian patients (32.75%) were more as compared to vegetarian patients (25.75%), patients adhering to the habit of alcohol were 23.75% and patients adhering to the habit of smoking were 17.75%.

Table 1. Distribution of patients according social habit

S.No	Type of Social Habit		No. of Patients (%)		Total no of patients (%) (n=400)
			Male	Female	
1	Type of food	Vegetarian	157 (39.25)	108 (27.00)	103 (25.75)
		Non-vegetarian	84 (21.00)	51 (12.75)	131 (32.75)
2	Alcohol		92 (23.00)	3 (0.75)	95 (23.75)
3	Smoking		71 (17.75)	0 (0.00)	71 (17.75)

Symptomatic Categorization:

Categorization of seasonal allergic patients based on symptoms mainly includes the conditions for which drug therapy will be given to the patients. Such categorization is dependable on to the cause or reason of seasonal allergy on to the patients. In seasonal allergic patients, the reason of allergy distributed mainly into different type of seasons like winter, fall, summer and spring. Hey fever is also an additionally important reason for seasonal allergy. From the Table 2, it was observed that the most common reason of allergy in all patients was hey fever (22%) accounting for 13.25% male and 8.75% female patients while least countable reason includes other reasons

of allergy (11.5%) accounting for 7% male and 4.5% female patients. According to seasons as the cause of allergy, winters were counted for 12% male and 8.5% female patients, fall includes 10.25% male and 7% female patients, spring season covered 9.75% male and 5.75% female patients, while summer contributed to the 8% male and 5.25% female patients.

Table 2. Distribution of allergy reasons

S.No.	Reason of allergy	No. of Patients (%)		Total No. of Patients (%) (n=400)
		Males	Females	
1	Hey fever	53 (13.25)	35 (8.75)	88 (22.00)
2	Winter	48 (12.00)	34 (8.50)	82 (20.50)
3	Fall	41 (10.25)	28 (7.00)	69 (17.25)
4	Spring	39 (9.75)	23 (5.75)	62 (15.50)
5	Summer	32 (8.00)	21 (5.25)	53 (13.25)
6	Others	28 (7.00)	18 (4.50)	46 (11.50)

Drug Utilization Evaluation:

A total of 400 prescriptions of seasonal allergic patients were selectively chosen for the study. From Table 3, it was shown that a total of 1245 drugs were prescribed through 400 prescriptions. Prescription analysis showed that 11.25% prescriptions contains one drug per prescription, 19.5% prescriptions contains two drugs per prescription, 30.5% prescriptions contains three drugs per prescription, 24.25% prescriptions contains four drugs per prescription and 14.5% prescriptions contains five drugs per prescription. The mean \pm SD number of drugs per prescription was 3.11 ± 1.39 . Maximum numbers of prescriptions (30.5%) include three drugs per prescription and there was predictably low incidence of polypharmacy on the basis of prescriptions with five drugs per prescription.

Table 3. Number of drugs per prescription

No. of Drugs per Prescription	No. of Prescriptions (%) (n = 400)
1	45 (11.25)
2	78 (19.50)
3	122 (30.50)
4	97 (24.25)
5	58 (14.50)

n = number of prescriptions

A total of 400 prescriptions of seasonal allergic patients contains variety of dosage forms in it. Dosage forms includes tablets, capsules, syrups, inhalars, injectables and topicals. Figure 3 showed that 183 (45.75%) prescriptions contains tablets that were the most commonly used dosage form among all the prescriptions. Syrups were the second most common dosage form prescribed in 87 (21.75%) prescriptions. Capsules were prescribed in 68 (17%) prescriptions. Topicals were prescribed in 27 (6.75%) prescriptions. Inhalers were prescribed in 25 (6.25%) prescriptions. Injectables were prescribed in 10 (2.5%) prescriptions.

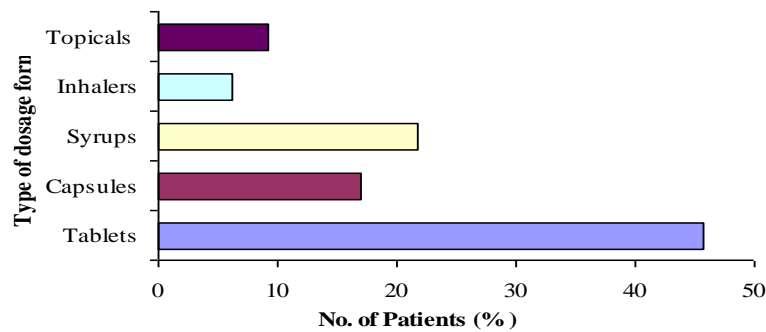


Figure 3. Types of dosage forms prescribed

For the treatment of seasonal allergic patients, some drug categories were commonly prescribed by the physicians. It includes antibiotics, steroids, anti-allergic drugs like antihistaminics, antileukotrienes, decongestants etc. and many more. Under the antibiotics category, the drugs

like amoxicillin, cefexime, levofloxacin, cefodoxime etc. are commonly used. Steroids includes prednisolone, betamethasone, dexamethasone etc. The antihistaminics drug category includes cetirizine, levocetirizine, azelastine, desloratidine, ebastine, loratidine, triprolidine etc. Antileukotrienes drug category includes montelukast, zafirlukast, pranlukast etc., while decongestants includes phenylephrine, oxymetazoline, ephedrine etc. All these drug categories played their significant and characteristic role in the drug therapy for seasonal allergy cases.

Prescribing frequency of drug classes were shown in Figure 4. It was observed from the study that antibiotics were prescribed in maximum number of patients (34.75%) while decongestants were prescribed in minimum number of patients (3.5%). Among the total antibiotics prescribed, 20.5% were male patients and 14.25% were female patients. In the category of steroid prescriptions, 16.25% prescriptions were of male patients and 8% prescriptions were belongs to female patients. Among the patients who received anti-histaminics in their prescriptions, 12.5% were male patients and 11.25% were female patients. Among antileukotriens containing prescriptions, 8.5% prescriptions were of male patients and 5.25% were of female patients. Among prescriptions containing decongestants, 2.5% prescriptions were of male patients while 1% was of females.

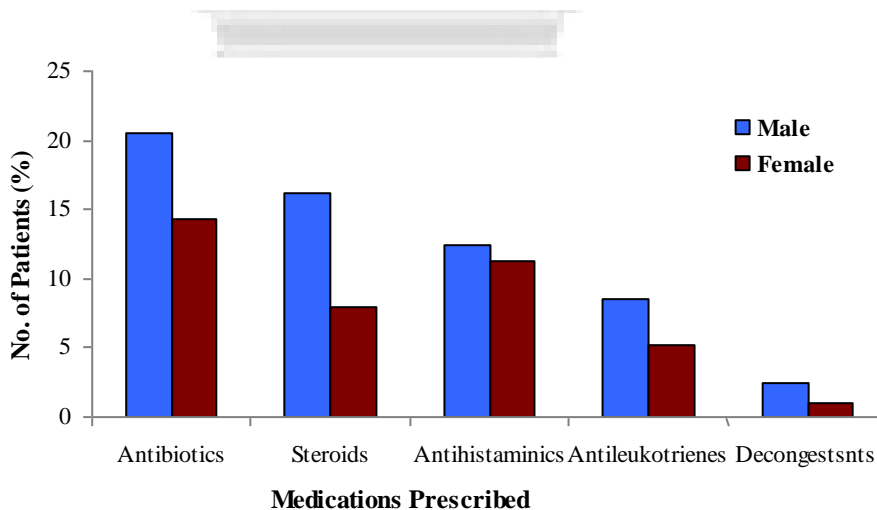


Figure 4. Prescribing frequency of drug classes

Among anti-allergic medications, commonly available drugs categories were antihistaminics, steroids, antileukotrienes and decongestants. From Figure 5, it was shown that most frequently prescribed anti-allergic drug was levocetirizine prescribed in 17.24% of the patients,

dexamethasone was prescribed in 15.33% of the patients, montelukast was prescribed in 13.03% of the patients, prednisolone was prescribed in 12.26% of the patients, cetirizine was prescribed in 9.96% of the patients, betamethasone was prescribed in 8.81% of the patients, zafirlukast was prescribed in 8.05% of the patients, desloratidine was prescribed in 6.9% of the patients, phenylephrine was prescribed in 3.83% of the patients while some other drugs were prescribed in remaining 4.6% of the total patients.

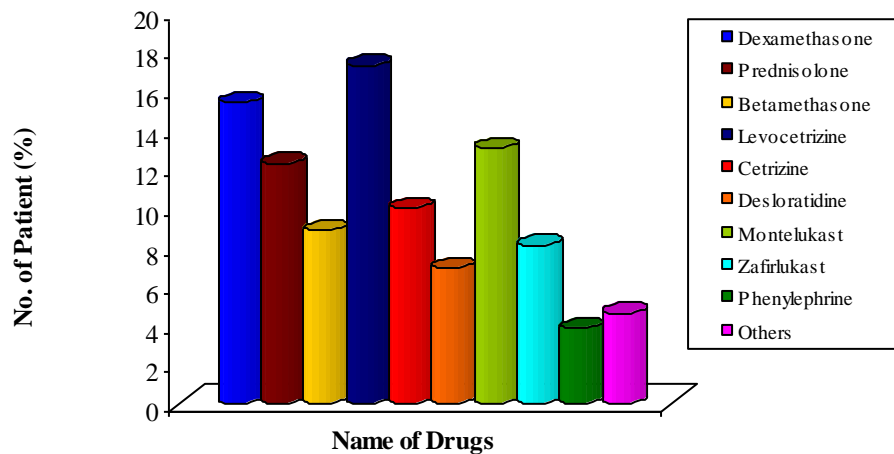


Figure 5. Prescribing frequency of anti-allergic drugs

Anti-allergic drugs prescribed as either mono-therapy or combination therapy was shown in Table 4. Steroids were the most frequently prescribed drug category in mono-therapy (39.31%), Anti-histamines were most frequently prescribed drug category in two-drug combination therapy (37.80%) and antileukotrienes were prescribed mostly in three or more drug combination therapy (60%).

Table 4. Mono-therapy and combination therapy

Anti-allergic Drug Category	No. of Prescriptions (%)		
	Mono-therapy (n = 173)	Two-drug combination (n = 82)	Three or more drug combination (n = 5)
Steroids	68 (39.31)	27 (32.93)	2 (40.00)
Antihistamines	63 (36.42)	31 (37.80)	0 (0.00)
Antileukotrienes	30 (17.34)	22 (26.83)	3 (60.00)
Decongestants	12 (6.93)	2 (2.44)	0 (0.00)

n = number of prescriptions

CONCLUSION

From the study, it can be concluded that a number of socio-economic and demographic variables influence the prevalence rates as well as therapeutic approach for the treatment. Lack of knowledge and awareness regarding source of health care is also a hindrance. Findings of the study shows that there was a remarked prevalence of seasonal allergic patients due to risk factors like age, gender, life style, environment, food habits, social habits etc. A major educational effort is required to inform the patients about the risk factors and complications. This study reflected the actual utilization of medications in allergy patients and among all drug categories, antibiotics were most commonly preferred. It was observed that among anti-allergic medications, commonly available drugs categories were antihistaminics, steroids, antileukotrienes and decongestants. Most frequently prescribed drugs were levocetirizine, dexamethasone, montelukast and prednisolone while cetirizine, betamethasone, zafirlukast, desloratidine, phenylephrine were prescribed to a lesser extent. Patient counseling needs to be encouraged to overcome the ever-rising problem of non-compliance in seasonal allergic patients.

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