

Study of Drug Utilization Pattern for Skin Diseases in Dermatology OPD of an Indian Tertiary Care Hospital - A Prescription Survey

ANUJ KUMAR PATHAK¹, SUBODH KUMAR², MANISH KUMAR³, LALIT MOHAN⁴, HARIHAR DIKSHIT⁵

ABSTRACT

Introduction: Skin diseases are the major contributors of disease burden in society. It affects individuals of all ages, neonates to elderly. Owing to its chronic nature, it causes serious impact on quality of life and financial status of the sufferer and his family. The problem gets compounded with the inappropriate and irrational use of medicines. Periodic prescription audit in form of drug utilization study is a way to improve the quality of prescription and curb the menace of irrational prescribing which has become a global phenomenon.

Aim: This study aims to determine the drug utilization pattern and assess the economic burden of the patient with skin disease.

Materials and Methods: It was a prospective, cross-sectional study conducted over a period of three months from January to March 2015 in newly diagnosed cases attending outpatient department of Skin and VD, IGIMS, Patna. The prescriptions were analysed with the help of descriptive statistics and results

were expressed in percentage.

Results: Total 752 prescriptions were analysed during the study. Male patients were lesser as compared to female as male to female ratio was 0.88. Over 50% of patients were in adolescent age group i.e. 21-40 years. Acne (17.95%) was most common disease in the study population followed by eczema and Dermatophytosis. Among the drugs, antihistaminics (24.13%) were prescribed most frequently followed by antifungals and antibiotics. Topical agents constituted almost 60% of the total prescription and average number of drugs per prescription was 5.13, irrespective of the dosage forms prescribed.

Conclusion: This drug utilization study provides an insight to the prescriber regarding various issues related to polypharmacy, cost analysis and prevalent disease pattern in the region. This study also suggests periodic evaluation of prescription pattern to monitor and improve quality of prescription in other departments of the hospital.

Keywords: Antifungals, Antihistaminics, Cost analysis, Drug utilization study

INTRODUCTION

Skin is the part of integumentary system that constitutes the largest organ of human body and thus it is exposed to injury by various extrinsic factors such as environmental, chemical, infectious agents as well as intrinsic factors such as metabolic, genetic and immunological. In addition to this, many systemic diseases are also identified by their dermatological manifestations thus it is said metaphorically as a mirror to various internal diseases [1,2].

Skin diseases are common and cause a huge disease burden globally. Collectively skin is the 18th leading cause of health burden worldwide and it was 4th leading cause of nonfatal health burden in 2010 globally [3]. The skin disorders constitute 2% of total Out Patient Department (OPD) consultations worldwide [4]. However no such data is available from India but still skin disorders in India are common and include pyoderma, acne, urticaria, dermatitis, scabies fungal skin infections and alopecia etc [5].

The skin disorders have serious detrimental effect on quality of life of the general population by increasing the suffering in terms of physical, social, psychological as well as it increases financial burden as most of the skin diseases are chronic and requires longer duration of treatment [6].

In India, there are various problems in prescription pattern of drugs like irrational drug combinations, overuse of multivitamins, unnecessary use of antibacterial in fungal conditions and prescribing drugs from same class [7,8]. It contributes to the emergence of antimicrobial resistance. Dermatologists account for almost 5% of antibiotic prescriptions worldwide and most of the conditions require prolonged treatment [9,10]. Further, the skin

conditions are wrongly diagnosed and treated. Thus continuous monitoring is needed to evaluate pattern of drug use to detect any changes from contemporary practices or available guidelines. Hence in order to generate data, drug utilization studies are need of the hour.

As per WHO, Drug utilization studies or research are tools that deals with the marketing, distribution and prescription pattern of drugs and helps to assess the subsequent impact of these on medical and socioeconomic status of patients [11]. Thus drug utilization studies helps in the understanding of prescription pattern as well as the quality of prescription in terms of rationality, drug interactions and financial burden of disease to the individual. These studies have a favourable impact on improving the standards of treatment and identify the problems related to polypharmacy, drug-drug interaction and adverse drug reactions. Periodic auditing of prescriptions in form of drug utilization studies are important tool to enhance the therapeutic efficacy, to minimize the adverse effect, to optimize the cost of the treatment and to provide useful feedback to the clinician [12,13]. Previous studies conducted in Australia suggest that academic detailing improves the quality of prescription and increases the adherence of clinician to standard treatment guidelines [14]. The data regarding pattern of drug used in India, particularly in dermatology departments are very limited.

AIM

Considering these facts the present study was done to assess the drug use pattern for common skin condition and to analyse the cost of individual prescription in outpatient department of Skin and VD at IGIMS, Patna, Bihar, India.

MATERIALS AND METHODS

Objective

To study the drug utilization pattern in dermatology outpatient department and cost analysis of the prescriptions obtained.

The permission to conduct the study was taken from Institutional ethics sub-committee prior to the study. The present study was conducted in Department of Skin and VD in IGIMS Patna. It was a prospective cross-sectional study conducted over a period of three months. A Performa was designed on which the data were compiled and later on analysed through extensive data mining. Prescriptions were collected on three alternate days in a week for a period of three months from January to March 2015. Total 752 prescriptions were collected during the study period, satisfying the WHO criteria for sample size which suggests to include at least 600 encounters in a cross-sectional survey to describe the current prescribing practices, with a greater number, if possible [15]. The inclusion criteria for the study included only OPD patients, first time visitors and newly diagnosed patients. For this prescriptions were collected from outpatient departments and also the help of hospital medical record department (MRD) section were taken to collect the data in days when prescriptions could not be collected from OPD due to some unavoidable reasons.

After extensive data mining, various relevant data were derived from the collected prescriptions that included demographic profiles, diagnosis or pattern of skin disease, classes of drug prescribed with their frequency and dosage form. Also, average number of drug prescribed per prescription and cost analysis of prescriptions were done. To calculate the number of drugs per prescription all the drugs in prescription were taken into consideration and divided by total number of prescriptions (n=752). In case of fixed dose combinations (FDC) all the component of FDC were taken separately to calculate the number of drugs.

RESULTS

[Table/Fig-1] illustrates the contribution of skin and VD OPD in total new patients of hospital during the study period of three months from January to March 2015. Total 34672 new patients attended the outpatient department in IGIMS Patna amongst which 1057 (3.04%) patients attended the skin and VD OPD. Of these prescriptions 752(n) prescriptions were found to satisfy the inclusion criteria for the study and were included for analysis.

Demographic data

[Table/Fig-2] shows that in this study number of male patients was 354 (47.07%) while number of female patients was 398 (52.93%) thus female patients outnumbered the males in this regard and male to female ratio was 0.88.

[Table/Fig-3] represents the age distribution of the study population where more than 50% of the patient were in the age group of 21 to 40 years and of them highest no. of patient were in the age group of 31-40 years (26.99%), followed by 21-30 year age group

Month	Total OPD attd.	Skin & VD
Jan-15	9284	295
Feb-15	11922	347
Mar-15	13466	415
Total	34672	1057
Ratio		3.04

[Table/Fig-1]: Hospital OPD Data.

Male	354	47.07
Female	398	52.93
Ratio	0.88	100.00

[Table/Fig-2]: Total prescriptions collected = 752(n).

(23.94%). No of patients at two extreme of ages were very less i.e. above 61 years only 3.06% followed by 6.91% at 0-10 years. It was found that there was progressive increase in number of patients as the age of the patient increases, till 40 years and then there was a decrease in number of patient.

Data on disease distribution

As in [Table/Fig-4], acne with (17.95%) was most common dermatological disorder closely followed by eczema (16.62%) and dermatophytosis (14.89%). Very small percentage of patients had scabies (7.57%) especially in paediatric age group. Alopecia (4.12%) and psoriasis (3.06%) were other disease but these were relatively uncommon. Pigmentation disorders including both hyper and hypo-pigmentation were 3.47%.

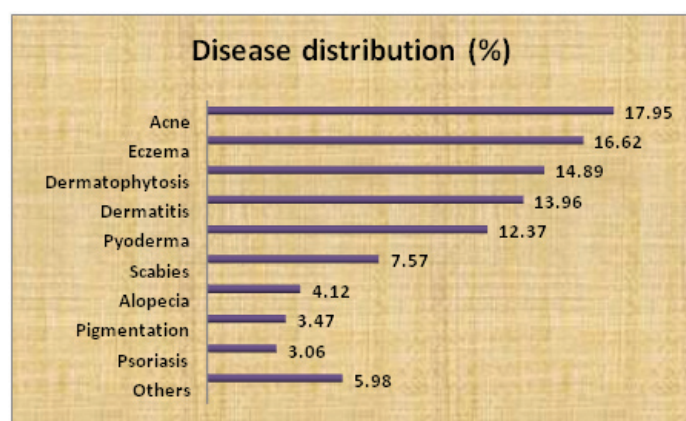
Data related to drug use

As shown in [Table/Fig-5], antihistaminics were the most common drugs prescribed (24.13%). Among antihistaminic second generation antihistaminics levocetirizine (41.22%) and cetirizine (19.17%) and fexofenadine (17.85%) were common while highly sedative hydroxyzine (11.77%) was used less commonly.

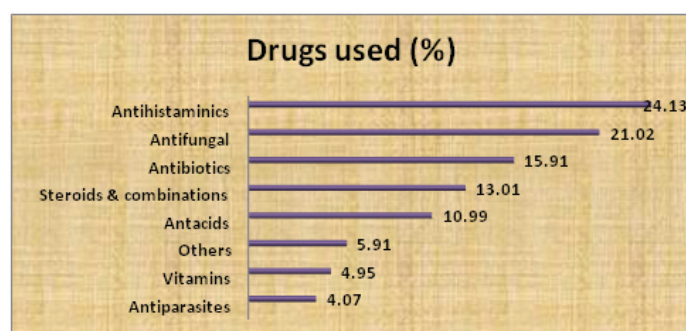
Antifungal (21.02%) was the second most common prescribed drug class. Among oral antifungals, fluconazole (53.12%), itraconazole (21.73%) were used and among topical agents clotrimazole, ketoconazole were used in form of powder, shampoo and soaps. Terbinafine (15.2%) was also used in both oral as well as in cream form for dermatophytosis treatment.

Age distribution	No. of Patient	Percentage
0-10	52	6.91
11-20	83	11.04
21-30	180	23.94
31-40	203	26.99
41-50	143	19.02
51-60	68	9.04
61 & above	23	3.06
Total	752	100.00

[Table/Fig-3]: Age distribution.



[Table/Fig-4]: Disease distribution (%).



[Table/Fig-5]: Drugs used (%).

Antibiotic (15.91%) were used in both oral (39.27%) as well as topical (60.73%) route. Among oral antibiotics, azithromycin, amoxicillin-clavulanic acid and cefadroxil was used and among topical antibiotics, clindamycin for acne treatment was very common, other than this mupirocin and fusidic acid and other fixed dose combinations of two or more antibiotics or along with steroids were used very frequently.

Topical steroids and their combinations were prescribed more frequently than oral or parenteral forms of steroids. This may be attributed to various systemic side effects of oral or parenteral steroid.

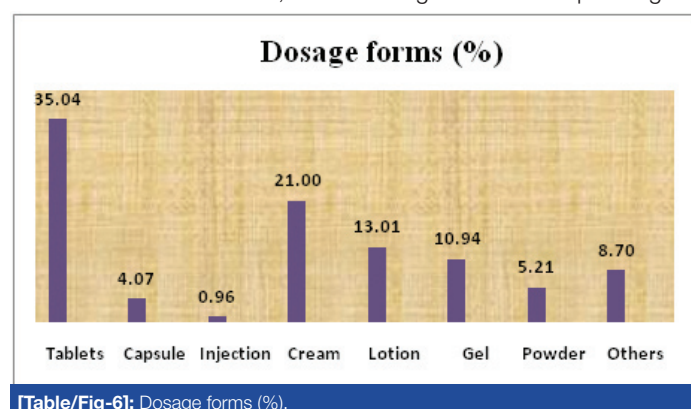
Ranitidine and pantoprazole were the two antacids prescribed frequently. Among antiparasites permethrin, ivermectin for scabies and albendazole and mebendazole as anthelmintics were prescribed in very few cases. Other drugs used in the treatment of skin diseases were some anti-herpes drugs, some antimetabolites like methotrexate, keratolytic, emollients and antileprotic agents etc. As the number of new cases with these diseases were very less so we grouped all these drugs as other drugs and these constituted 5.91% of the prescriptions.

Dosage forms of the drugs

[Table/Fig-6] represents the drugs used in various dosage forms and route of administration for treatment of skin disease. It included oral form i.e. tablets (47.11%), parenteral i.e. injections (0.96%) and various topical (51.93%) route of administration. Use of parenteral forms were very much limited and usually given for severe forms of infections resistant to oral antibiotics, intralesional corticosteroids, and systemic fungal infections. Various antibacterial and antifungal agents were prescribed in topical dosage forms as clotrimazole powder, ketoconazole shampoo, mupirocin ointment, fusidic acid ointment lotions gel, cream. Also, various corticosteroid and their combinations in ointment and gel forms were also available and prescribed. Tablet was prescribed most commonly (35.04%) that included various antihistaminics, antifungal and antacids preparations. Some antacids, antibacterial and multivitamins were prescribed in capsule form (4.07%) also. In topical agents, ointment was the most common dosage form prescribed (21.00%) with different compositions of steroid and their combinations, some antifungal and antibacterial drugs. This was followed by lotion (13.01%), as zinc calamine lotion for soothing, astringent, antipruritic effect and gel preparations (10.94%) as for antiacne and antibacterial preparations. Powder forms were prescribed for external use in (5.21%) of cases and it was mostly antifungal preparation and dusting powder and boric acid. Other dosage forms included shampoo for seborrheic dermatitis, antihistaminic and antibiotic syrups to children and some liquid antacids preparation to adults, etc.

Number of drugs per prescription

Total number of drugs prescribed in 752 prescriptions were 3858. Thus average number of drugs per prescription in this study comes to 5.13. However, it had a large variation depending on



[Table/Fig-6]: Dosage forms (%).

type of disease and its severity. Most of the prescription had 4 to 5 drugs while very few prescriptions with disease of lesser severity were treated with only one or two drugs. Some other patients with very extensive lesions required 6 or more drugs of different classes including systemic as well as topical agents.

Cost per prescription

Average total cost per prescription was found to be INR 487.50 with minimum prescription cost of INR 57 and maximum prescription cost of INR 1783 for 7 days treatment. In majority of the prescriptions, the cost of one week treatment was within the range of INR 200-300. However, small number of prescriptions reported very high cost per prescription that was attributed to some high cost drugs such as immunomodulators (tacrolimus), antifungals (itraconazole). This shifted the average cost per prescription to higher values. Polypharmacy also factored in inflating the average cost per prescription.

DISCUSSION

Prescription is a written instruction given by a qualified medical practitioner with the intent to provide medicine or treatment for the benefit of the patient. Thus the prescription in other words reflects the doctors knowledge and his attitude to treat the patient with due consideration of the patient's condition physically as well as financially [16]. Availability and affordability are the two major determinants of a prescription and various other very important parameters are quality, rationality, completeness and cost per prescription. And one study that incorporates all these components is the drug utilization study. Till now very few drug utilization studies have been conducted in our institute and thus we did not have any comparable data of other studies from our institute. Thus ultimate aim of the study was to help the dermatology prescriber in achieving rational and affordable treatment to their patients in terms of cost. This will also help in the mission of providing "Health care to all" [17].

Patient related data

In our study the total no of new patients attending skin OPD was 3.04% of the total OPD attendance. These included new as well as follow up patients. Of the 752 prescription collected, no. of females were more than the no. of male that was in line with the study of Manjusha Sajith et al., and differs slightly from the study of Bijoy KP et al., [18,19]. In this study, more than 50% of the patients were adult in the age group 21-40 years, this was higher than the study conducted by Bijoy KP et al., and Sarkar et al., [19,20].

Disease distribution

Our study findings suggested that acne was most common disease of skin at our institute in the study duration. This was more common in females, involving face and in some cases on chest and back, mostly these were mild and non scarring. In this study the age group most commonly affected by acne was adolescents group this may be due to androgen induced increased sebum production, formation of comedone by excessive keratin deposition, follicle colonization by *Propionibacterium acnes* bacteria leading to inflammation and release of pro-inflammatory mediators in the skin [21]. In a study by Sarkar et al., cutaneous infections (40%) were the most common dermatologic condition followed by eczema (31%) [20]. In our study eczema with a myriad aetiologies was next in order. Atopic dermatitis, allergic contact dermatitis, seborrheic dermatitis was three common types encountered. The common fungal infections were dermatophytosis e.g. tinea cruris (ring worm), tinea capitis, tinea corporis and candidiasis. This may be due to sweating, high humidity and poor personal hygiene. Other disorders like psoriasis, leprosy and pigmentary disorders were very less in number.

Number of drug per prescription

Average number of drugs per prescription in our study was 5.13, which was very high as compared to studies by Sarkar C et al., and Narwane SP et al., where average number of drugs prescribed were lesser than 3 drugs per prescription i.e., 2.42 and 2.7/prescription respectively [20,22]. Polypharmacy promotes undesirable drug interactions and irrational drug prescribing. Unnecessary prescription of drugs increases the incidence of side effects and increases the economic burden to patients. So this was the issue of concern in our institute and we need to improve this.

Pattern of drug use

Our study finding showed antihistaminics as the most commonly prescribed drug class followed by antifungals and antibiotics which was similar to the study carried out by Narwane SP et al., showing antiallergics as the most commonly prescribed drug followed by antifungal and antibiotic [22]. This is expected as pruritus is one of the major complaints associated with majority of skin diseases and it is very troublesome and socially annoying to patient [23]. Antihistaminics are the mainstay for treatment of pruritus, and it is also prescribed other allergic conditions. Among these, second generation antihistaminics, that are non-sedative bears the major part of all the prescriptions. Levocetirizine, cetirizine, fexofenadine and loratidine are the main drugs in this group. These were prescribed mainly at the day time and patients were advised to avoid driving after taking medicines [24]. Highly sedative antihistaminics like hydroxyzine was prescribed for severe cases of urticaria, intractable pruritus, eczema etc and patients were usually prescribed to take them at bedtime. Antifungal drugs were the second most widely prescribed class in our study which was less prescribed as compared to the study conducted by Yuwante AH et al., in which it was 33.5% of the total drug used [25]. In our study topical antifungal e.g. clotrimazole, ketoconazole, terbinafine etc. were prescribed more frequently (82.12%) than the oral antifungals like fluconazole and itraconazole. Further fluconazole was most common in oral antifungal group this may be due to its cost effectiveness and once in a week dosing. Antibiotics including antiseptics constitute (16%) of prescription which was almost equal to the study conducted by Yuwante AH et al., [25]. Steroids and their various FDC contributed (13.05%) of total prescriptions. Here also topical agents were prescribed in maximum number of patients. This may be due to various side effects associated with systemic steroid therapy as well as its site specific action, less systemic absorption resulting in less side effects and convenient for patient use. This finding was comparable with studies by Sarkar C et al., and Khan NA et al., that showed steroid and antibiotics were most commonly prescribed topically [20,26]. Topical corticosteroids are mainly used for non-infective dermatologic disorders such as atopic dermatitis and contact dermatitis, lichen planus, psoriasis etc., Ranitidine and pantoprazole among antacids was prescribed in good number of cases. Here pantoprazole had upper hand due to its one time dosing and better patient compliance. Beyond this a large number of drugs e.g. multivitamins, retinoids, immunosuppressants, paracitides etc were also prescribed in our study for the treatment of particular disease but individually these contributed to very small percentage of cases.

Frequency, duration of administration, dose/strength and diagnosis was specified in majority of prescriptions (95%) in our study which shows rational prescribing also majority of prescriptions were complete with respect to patient related data and doctors initial. All the OPD prescriptions card had the message and toll free number over their footnote for spontaneous reporting of adverse drug reactions and patient were educated by the prescriber regarding this facility.

Cost analysis of the prescription

In our study average cost per prescription was INR 487.50 this was high as compared to the study by Narwane et al., [22]. This high cost may be attributed to the polypharmacy, absence of generic drugs in prescription as well as high cost of the dermatological products. In a similar study where generic drugs were prescribed, cost was merely 19.40 INR [22]. As majority of patients in our hospital belongs to the poor socio-economic strata, the cost of treatment was major determinant for drug compliance [27]. This cost excluded the amount spent by patient on other expenditures such as cost of diagnosis, cost of travel loss of wages etc. So use of generic drugs should be promoted to improve the compliance and reduce the economic burden of the disease.

Irrational drug prescription is a global problem among the physicians and solution has to come from the physicians himself as well as locally in form of appropriate policies and guidelines in accordance with WHO guidelines. In light of the finding of this survey, following recommendation can be given to minimize the irrational prescribing and the risk associated with it. It includes-

- Formulation of policies related to appropriate use of medicines
- Making a hospital based formulary
- Continuous supervision, audit and monitoring of prescription and feedback
- Continuing education of involved health care provider

CONCLUSION

Drug utilization study is an effective tool to promote rational and cost-effective drug prescribing. Despite all the limitations such as small sample size, shorter study duration, and single study centre etc the study may prove to be an eye opener for the healthcare provider. This study suggests the prescribers to consider factors as polypharmacy, rationality of prescription and cost benefit analysis before writing any prescription. Hospital authority should also take concrete steps to ensure generic prescribing to reduce the cost of treatment and to sensitize the physicians regularly regarding the need of rational prescribing by conducting continuing medical education.

ACKNOWLEDGMENT

We would like to express our sincere thanks and gratitude to Dr. K C Jaykar, Assistant Professor, Department of SKIN & VD and 3rd semester undergraduate students of IGIMS Patna for their valuable support to carry out the study and collect data.

Ethical approval: The study was approved by the Institutional Ethics Committee

REFERENCES

- [1] Clark AF, Ghosh K, Tonnesen MG. Tissue Engineering for Cutaneous Wounds. *Journal of Investigative Dermatology*. 2007;127:1018-29.
- [2] Engman MF. The Skin: A Mirror to the System. *JAMA*. 1919;73(21):1565-68.
- [3] Hay RJ, Johns NE, Williams HC, Bolliger IW, Dellavalle RP, Margolis DJ, et al. The Global Burden of Skin Disease in 2010: An Analysis of the Prevalence and Impact of Skin Conditions. *Journal of Investigative Dermatology*. 2014;134:1527-34.
- [4] Saravanakumar RT, Prasad GS, Ragul G, Mohanta GP, Manna PK, Moorthi C. Study of prescribing pattern of topical corticosteroids in the department of dermatology in multi- speciality tertiary care teaching hospital in south India. *Inj J Res Pharm Sci*. 2012;3(4):685-87.
- [5] Gangadharan C, Joseph A, Sarojini PA. Pattern of skin diseases in Kerala. *Indian J Dermatol Venereol Leprol*. 1976;42:49-51.
- [6] Joel JJ, Jose N, Shastry CS. Patterns of Skin Disease and Prescribing Trends in Rural India. *Sch Acad J Pharm*. 2013;2(4):304-09.
- [7] Soumerai S. Factors influencing prescribing. *Aust J Hosp Pharm*. 1988;18(suppl):9-16.
- [8] Hogerzeil HV. Promoting rational prescribing: an international perspective. *Br J Clin Pharmacol*. 1995;39:1-6.
- [9] Divyashanthi CM, Nandhini A, Kumar SA. Study on drug utilization pattern of antibiotics among dermatology in-patients of a tertiary care teaching hospital, Karaikal, Puducherry. *Int J Basic Clin Pharmacol*. 2014;3(6):1072-77.

- [10] Chon SY, Doan HQ, Mays RM, Singh SM, Gordon RA, Tying SK. Antibiotic overuse and resistance in dermatology. *Dermatologic Therapy*. 2012;25(1):55-69.
- [11] Sjoqvist F, Birkett D. Drug utilization. In: Bramley DW, editor. Introduction to Drug Utilization Research (WHO Booklet). New York: WHO Office of Publication; 2003: 76-79.
- [12] Sweileh WM. Audit of prescribing practices of topical corticosteroids in outpatient dermatology clinics in north Palestine. *Eastern Mediterr Health J*. 2006;12(1/2):161-69.
- [13] Good CB. Polypharmacy in elderly patients with diabetes. *Diabetes Spectrum*. 2002;15(4):240-48.
- [14] Markey P, Schattner P. Promoting evidence-based medicine in general practice - the impact of academic detailing. *Fam Pract*. 2001;18(4):364-66.
- [15] Prasad PS, Rudra JT, Vasanthi P, Sushitha U, Sadiq MJ, Narayana G. Assessment of drug use pattern using World Health Organization core drug use indicators at Secondary Care Referral Hospital of South India. *CHRISMED J Health Res*. 2015;2:223-28.
- [16] Shankar RP, Partha P, Nagesh S. Prescribing patterns in medical outpatients. *Int J Clin Pract*. 2002;56(7):549-51.
- [17] Kumar AK, Chen LC, Choudhary M, Ganju S, Mahajan V, Sinha A, et al. Financing health care for all: challenges and opportunities. *Lancet*. 2011;377(9766):668-79. DOI: [http://dx.doi.org/10.1016/S0140-6736\(10\)61884-83](http://dx.doi.org/10.1016/S0140-6736(10)61884-83).
- [18] Sajith M, Lokhande KD, Padma S, Pawar AP. Prevalence of various skin disorders and prescribing pattern of antihistamines in tertiary care hospital, Pune. *Int J Pharma Sci Res*. 2014;5(3):73-78.
- [19] Bijoy KP, Vidyadhar RS, Palak P, Chintan SP, Atmaram PP. Drug prescribing and economic analysis for skin diseases in dermatology OPD of an Indian tertiary care teaching hospital: a periodic audit. *Indian J Pharm Pract*. 2012;5(1):28-33.
- [20] Sarkar C, Das B, Sripathi H. Drug prescribing pattern in dermatology in a teaching hospital in western Nepal. *Journal of Nepal Medical Association*. 2001;41:241-46.
- [21] Simonart T. Immunotherapy for acne vulgaris: current status and future directions. *Am J Clin Dermatol*. 2013;14(6):429-35.
- [22] Narwane SP, Patel TC, Shetty YC, Chikhalkar SB. Drug Utilization and Cost Analysis for Common Skin Diseases in Dermatology OPD of an Indian Tertiary Care Hospital - A Prescription Survey. *British Journal of Pharmaceutical Research*. 2011;1(1):9-18.
- [23] Leslie TA, Greaves MW, Yosipovitch G. Current topical and systemic therapies for itch. *Handb Exp Pharmacol*. 2015;226:337-56. doi: 10.1007/978-3-662-44605-8_18.
- [24] Skidgel RA, Kaplan AP. Histamine, Bradykinin, and Their Antagonists. In: Bruton LL, Chabner BA, Knollmann CB. Editors. *The Pharmacological Basis of Therapeutics*. 12th ed. New Delhi: McGraw Hill; 2011. Pp. 911-935.
- [25] Yuwnate AH, Chandane RD, Giri KR, Yunati MS, Sirsam SS. A multicentre pharmaco-epidemiological study of dermatological disorders in Wardha district. *Int J Basic Clin Pharmacol*. 2013;2:751-56.
- [26] Khan NA, Abid M, Maheswari KK, Kaviarasan PK, Mohanta GP. Antibiotic prescribing pattern in department of dermatology of a teaching hospital in Tamil Nadu. *Indian J Pharm Pract*. 2010;3(3):18-21.
- [27] Gupta N, Sharma D, Garg SK, Bhargava VK. Auditing of Prescriptions to study utilization of antimicrobials in a tertiary hospital. *Ind J Pharmacol*. 1997;29:411-15.

PARTICULARS OF CONTRIBUTORS:

1. Senior Resident, Department of Pharmacology, IGIMS, Sheikhpura, Patna, Bihar, India.
2. Assistant Professor, Department of Pharmacology SRMSIMS, Bareilly, UP, India.
3. Assistant Professor, Department of Pharmacology, IGIMS, Sheikhpura, Patna, Bihar, India.
4. Associate Professor, Department of Pharmacology, IGIMS, Sheikhpura, Patna, Bihar, India.
5. Professor, Department of Pharmacology, IGIMS, Sheikhpura, Patna, Bihar, India.

NAME, ADDRESS, E-MAIL ID OF THE CORRESPONDING AUTHOR:

Dr. Lalit Mohan,
Associate Professor, Department of Pharmacology, Indira Gandhi Institute of Medical Sciences,
Sheikhpura, Patna- 800014, Bihar, India.
E-mail: dr_lalitjee@rediffmail.com

Date of Submission: **Oct 09, 2015**
Date of Peer Review: **Dec 02, 2015**
Date of Acceptance: **Dec 11, 2015**
Date of Publishing: **Feb 01, 2016**

FINANCIAL OR OTHER COMPETING INTERESTS: None.