Drug Utilization and Cost Analysis for Common Skin Diseases in Dermatology OPD of an Indian Tertiary Care Hospital - A Prescription Survey

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Case Study

ABSTRACT

Introduction: Epidemiology of skin diseases has been studied and evaluated occasionally. In view of high incidence of skin diseases and economic burden that it poses, there is a need to evaluate the present epidemiology and prescribing pattern of skin disorders.
Objective: To assess common skin conditions, drug utilization patterns and cost analysis in Dermatology Out patients Department (OPD) of Tertiary Care hospital.
Methodology: After taking Ethics committee's permission, prescriptions of 600 patients attending Dermatology OPD were audited. The prescriptions were analyzed for common skin conditions drug utilization and cost analysis.
Results: The common skin conditions found were Pyoderma and Scabies while common classes of drugs prescribed were antiallergics, antifungals and steroids. Drugs prescribed by Generic name were 16.6% and Brand names were 83.4%. It was revealed that 30% of total drugs dispensed from hospital pharmacy and 70% from outside pharmacy. Average hospital and outside pharmacy costs were INR19.40 and INR116.20, respectively. The outside pharmacy cost of prescription (Spearman's Rho = -0.130, p < 0.01) as well as cost paid by the patients (Spearman's Rho = 0.408, p < 0.001) had a negative correlation with the socioeconomic score as the drugs were prescribed irrespective of the socioeconomic class.
Conclusion: The dermatological prescription analysis gives a message to the prescribing physician to achieve rational and cost effective medical care. The drugs which are made available in the hospital pharmacy should be based on clinical evidence generated from

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meta-analysis of drug studies, pharmacoepidemiology and pharmacoeconomic studies. There is dire need for physicians training with regards to rational use of drugs and pharmacoeconomics. Hospital should make essential drugs available with continuous monitoring to improve the prescribing pattern. The limitation of this study is that the actual direct costs and indirect costs were not studied. It opens the scope for further study in this area.

Keywords: Socioeconomic status, skin diseases, observational study, epidemiology, prescribing patterns;

1. INTRODUCTION

Skin disease refers to disorders exclusively of the superficial layers of the skin. The commonest skin disorders seen in developing countries are pyoderma and scabies, but they have not been regarded as a significant problem that could benefit from public health measures. The recent literature on common skin diseases in developing countries is sparse. The incidence data in the general population are scarce; those that are available vary considerably from one place to another. Most skin diseases are chronic and require lifetime treatment. The cost of skin diseases has been estimated on few occasions only, but was found significant in the scabies and pyoderma where patient seeks treatment (WHO, 2006).

Academic detailing has been successful in increasing the clinicians' adherence to any guidelines. A study conducted in Australia states that the clinician's adherence to the antibiotic guidelines was increased after academic detailing (Markey et al., 2001).

Considering the economic burden the skin diseases cause owing to its high prevalence, it is of interest to study the drug prescribing patterns and cost effectiveness of skin diseases.

Irrational prescription of drugs is a common occurrence in clinical practice (Soumerai, 1988). The cost of such irrational drug use is enormous in developing countries in terms of both scarce resources and the adverse clinical consequences of therapies that may have real risks but no objective benefits (Lamichhane et al., 2006). Therefore periodic auditing of prescriptions is essential to increase the therapeutic efficacy, decrease adverse effects and provide feedback to prescribers (Krishnaswamy et al., 1985).

Previous studies conducted in the department of Medicine and Psychiatry in KEM hospital, Mumbai had shown deficiencies in the rational use of medicines (Shetty et al., 2008; Goyal, 2008). The problem observed was that most of the drugs were prescribed by brand names and the number of drugs prescribed from the Hospital formulary was very low.

Drug utilization studies are useful for obtaining information about drug use patterns and for identifying high cost drugs (Lamichhane et al., 2006). Such analysis not only improves the standards of medical treatment at all levels in the health system, but also helps in the identification of problems related to drug use such as poly-pharmacy, drug-drug interaction, and adverse drug reaction (Michael et al., 2003; Sweileh et al., 2006; Chester, 2002) The data regarding drug usage patterns in Dermatology in India are particularly lacking. Keeping these facts in consideration the present study was planned to define the pattern of drug use for the common skin conditions, their availability in the hospital pharmacy and to evaluate

the cost analysis of each prescription in the Dermatology Out Patient Department at Tertiary Care Hospital in Mumbai, India.

2 METHODOLOGY

The Institutional Ethics Committee permission was taken before initiation of the study. Written Informed Consent was taken from all the patients before their prescription were analyzed. The present study was conducted in the Department of Dermatology at Tertiary Care Hospital, Mumbai.

Prescriptions of 600 patients attending skin OPD were analyzed as per WHO guidelines in regards to sample size calculation for such studies (WHO, 1993). The variables assessed from the prescriptions included the demographic profile (male/female, age, socio economic status according to Kuppuswamy scale (Kumar et al., 2007), various common conditions related to skin, various classes of drug prescribed (antibiotics, antiallergics, steroids, anti-fungals, or any other class) with their dosage form, dose, frequency and duration of administration, average number of drugs prescribed per encounter, drugs prescribed by generic or brand name, number of fixed-dose combination versus single agents ,average number of drugs prescribed from hospital pharmacy or outside pharmacy and cost analysis per prescription. The results were calculated by Graphpad Instat, version 3.06.

3 RESULTS AND DISCUSSION

In the demographic profile, among the 600 prescriptions, 358 were males and 242 were females.
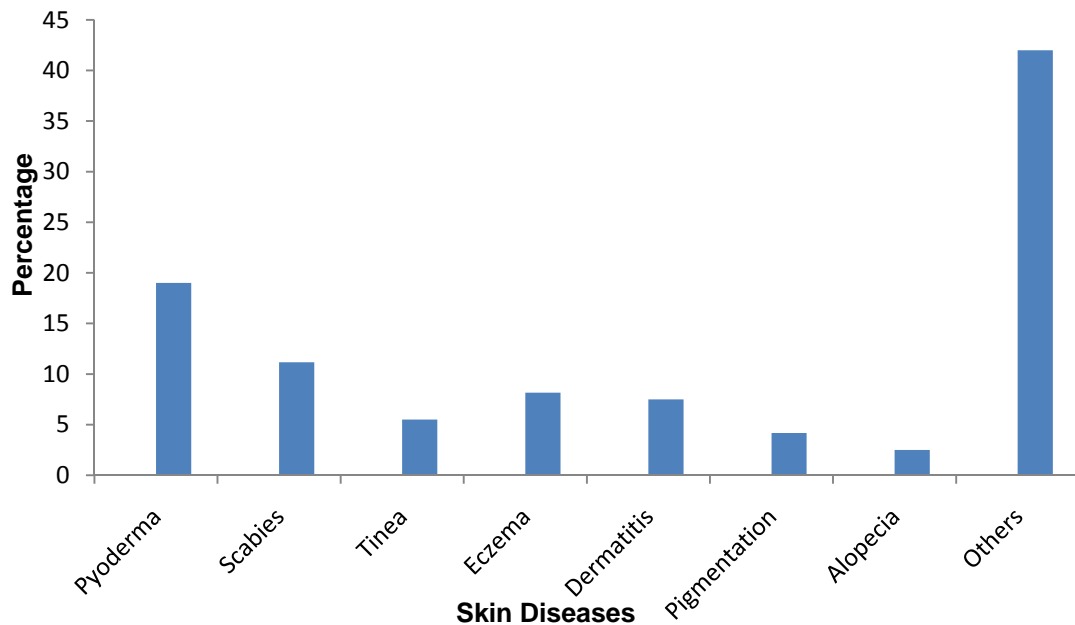

Fig. 1. Distribution of common skin diseases

The common skin conditions encountered in the Dermatology OPD were Pyoderma (19%), Scabies (11%), Eczema (8%), Tinea (5.5%) and Dermatitis (7.5%) and others as shown in the Figure 1.

Figure 2 depicts the data of most frequently prescribed class of drugs which were found to be antiallergics followed by antifungals, antibiotics and steroids.
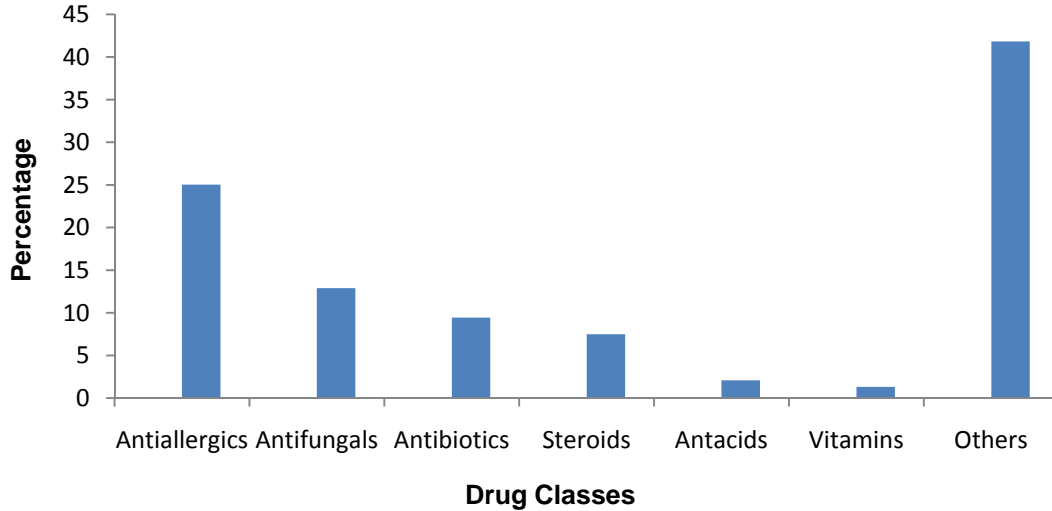

Fig. 2. Percentage of different classes of drugs prescribed in the Dermatology OPD

The average numbers of drugs per prescription were 2.7. Only 16.6% drugs were prescribed by their Generic name and the remaining 83.4% were in Brand names. 30% of total drugs prescribed were dispensed from Hospital pharmacy and the remaining 70% from outside pharmacy. The fixed dose combinations prescribed were found to be 1.9%. The polypharmacy found in the prescriptions were 58% (Table 1).

Table 1. Analysis of prescriptions of 600 patients with respect to different parameters.

Sr. No.	Drug use Indicators	Results
1.	Average number of drugs per prescription (Mean ± SD)	2.70±0.93 (1590/600)
2.	Percentage of drugs prescribed by generic name	16.6% (264/1590)
3.	Percentage of drugs prescribed by Brand name	83.4% (1326/1590)
4.	Percentage of scheduled drugs actually dispensed from the hospital pharmacy	30% (477/1590)
5.	Percentage of fixed dose combination	11.9% (189/1590)
6.	Percentage of polypharmacy in prescription	58% (348/600)

In our study we found the most common drug prescribed was tablets followed by creams (Figure 3).

The study population was classified in accordance with Kuppuswamy scale (Kumar et al., 2007), taking into account the education, type of profession and family income per month. 51% of patients' belonged to the lower middle class, 33.66% to upper middle class, and 13.66% were of upper lower class (Figure 4).
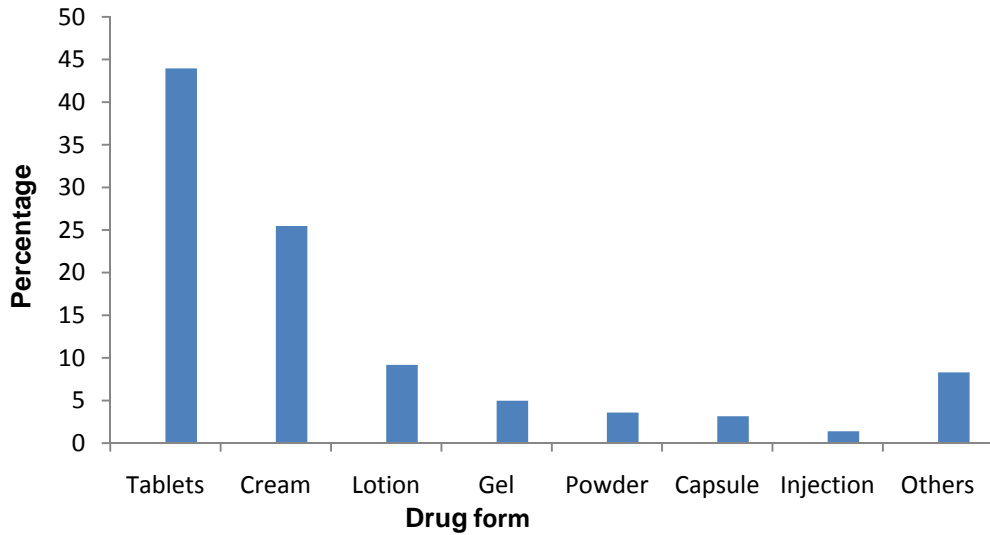
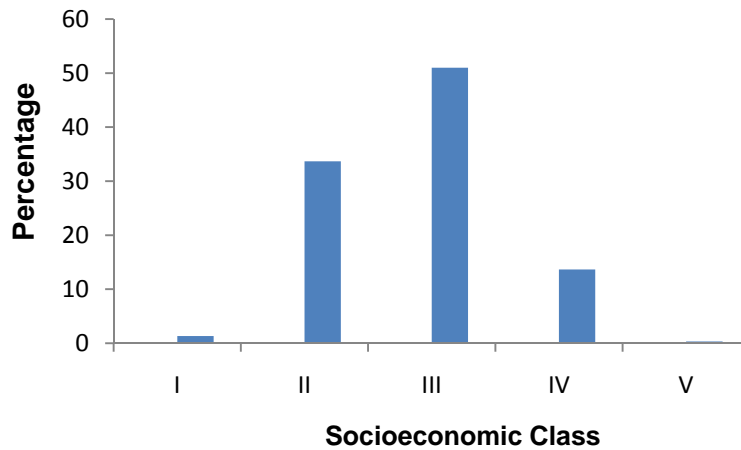**Fig. 3. Percentage of different prescribed drug forms**

Fig. 4. Distribution of studied population as per socioeconomic status

Average total cost per prescription was found to be INR135.60, while average hospital and outside pharmacy costs were INR19.40 and INR116.20 respectively (Table 2).

Table 2. Pharmaco economic data of the prescriptions

Sr. No.	Parameter	Cost in INR
1.	Average total cost per prescription	135.6*
2.	Average hospital pharmacy cost per prescription	19.4*
3.	Average outside pharmacy cost per prescription	116.2*

(*= $p<0.0001$); 1 US $= 44.98 (5th March, 2011)

A prescription by a doctor is a reflection of physicians' attitude towards the disease and the role of drug in its treatment (Shankar et al., 2002). The ultimate outcome of the dermatological prescription analysis gives a message to the prescribing physician to achieve rational and cost effective medical care (Dirk et al., 2007). It also provides an insight into the nature of health care at that facility.

In our study we found Pyoderma and scabies as common disorders. This data is comparable to a study conducted by Jaiswal et al. (1994). The factors responsible for the above finding can be the humid environmental condition, overcrowding, poor hygiene and lack of water. These diseases can be predictors of the morbidity pattern of that region.

Antiallergics were the most frequently prescribed drug class found in our study followed by antifungals, antibiotics and steroids. No comparator study could be found which has evaluated the frequency of different classes of drugs prescribed in Dermatology Outpatient Department. Nevertheless, our findings suggest that there was a correlation between classes of drug prescribed with the disease encountered. The antiallergics prescribed was very high as majority of the patients attending the dermatology OPD had scabies as well as fungal infections with itching as a common feature for which antiallergics are prescribed. The second commonly prescribed drugs found were antifungals. Among the antifungals, Miconazole and Fluconazole were commonly prescribed due to their availability in the hospital pharmacy.

The next common class of drugs prescribed was antibiotics which were prescribed for the treatment of pyoderma. In a study by Kshirsagar et al. (1998), comparing the prescribing patterns of medical practitioners, the antibiotics prescribed were ranging from 59% to >90%, which is greater as compared to our finding. This is due the difference in morbidity pattern in general population where infection is commonly encountered.

We also found that steroids were another class of drugs commonly prescribed. Among the steroids prescribed, topical Steroid formulation (clobetasol) was commonly prescribed as it was available in the hospital pharmacy. The other steroids prescribed included Halobetasol, Beclometasone and Betamethasone from outside pharmacy. As per the hospital policy, all these drugs which are cheaper should be made available or the doctors should be trained to prescribe the drugs from hospital pharmacy only. Prescribing drugs from outside pharmacy increases the cost of treatment and this could be done in consensus with the patient. In our

study, Permethrin was prescribed to all patients of scabies from outside, when Benzyl Benzoate was available in the hospital pharmacy. Though Benzyl Benzoate is a cheaper alternative for treating scabies but requires 3 times application and causes skin irritation as a side effect. Permethrin is the suitable for scabies, owing to its single application as compared with Benzyl Benzoate (WHO, 2006). Therefore, the rationale for prescribing expensive medications should be clear to the physician when cheaper alternatives are available. In this context, the drugs which are made available in the hospital pharmacy should be based on clinical evidence generated from meta-analysis of drug studies, pharmacoepidemiology and pharmacoeconomic studies.

In addition each hospital should have a Drug Therapeutic Committee which will give its recommendation based on their finding and analysis to the hospital administration.

It has been recommended that the limit of number of drugs prescribed per prescription should be two and that justification for prescribing more than two drugs would be required because of the increased risk of drug interactions (Nies et al., 1990). In our study, the average number of drugs per prescription was found to be 2.7, which is more than the current recommendation. These in turn can lead to lot of side effects in the form of drug interactions which may lead to unnecessary hospitalization increasing the cost of treatment again. The increase in the number of drugs per se also increases the cost of prescription. In the present study, only 16.6% drugs were prescribed by their generic name and the remaining 83.4% were in brand names. In a similar study conducted by Kshirsagar et al. (1998), generic drugs were prescribed in the range of 3% to 20%. Due to this trend of prescribing large number of drugs in brand name, it could possibly result in prescribing errors due to similar brand names leading to increase inside effects in turn increasing the cost of the treatment (Rataboli et al., 2005). In general, generic drugs are less expensive as compared to the brands that contain the same active ingredient (Brady et al., 2003).

When the various drug forms were compared it was found that topical formulations (in the form of creams, lotions, ointments, powder, shampoo, oils and gel) are commonly prescribed followed by tablets, capsules and injections. In a study by Biswas et al. (2001) the maximum number of drugs prescribed were in the form of eye drops (topical form), followed by tablets. This is because the topical application are preferred in almost all skin conditions while eye drops are required in conditions related to eye. This finding supports the use of topical preparation for treating skin disease as they have site specific action, less systemic absorption resulting in less side effects and convenient for patient use.

The fixed dose combinations (FDCs) prescribed were 11.9% which is lower as compared to the percentage of FDCs prescribed in a study conducted by Kshirsagar et.al. (1998). However use of FDCs was less in our study, because the common conditions were pyoderma where systemic treatment is required and scabies where topical scabicidal are effective. Polypharmacy was observed in 58% of prescriptions. This practice of polypharmacy should be restricted to conditions, as many a times they are unnecessary, increasing the morbidity by pharmacokinetic and pharmacodynamic drug interactions and increasing the cost of treatment.

Among the drugs listed in the WHO's list of essential drugs for skin conditions (WHO Model List of Essential Medicines, 2007), the following drugs were not available in hospital pharmacy - sulfadiazine silver (1% cream), neomycin sulfate plus bacitracin ointment, oral griseofulvin, thiosulfate sodium, gentian violet, potassium permanganate, chlorhexidine, iodine polyvidone, permethrin, 1% hydrocortisone, 0.1% betamethasone valerate and

dithranol. Among these drugs permethrin, betamethasone were the frequently prescribed drugs from outside pharmacy in the OPD. Hence the hospital authorities should make provisions for making these drugs available in the hospital pharmacy.

The study population was classified in accordance with Kuppuswamy scale, majority of the patients belonged to lower middle class. In a similar study by Goyal et al. (2008) in psychiatry, the most common class was upper lower class. These findings suggest that there is a disparity in the socioeconomic class of patients attending Dermatology and Psychiatry OPD. As this hospital caters mainly to those patients who belong to poor socioeconomic strata, and dermatological treatment from private setup is very expensive, patients tend to attend public hospital OPD and our findings strengthen the same.

In our study, average total cost per prescription was 135.60 INR. The average hospital pharmacy cost per prescription was 19.40 INR, which was much lesser as compared to average outside pharmacy cost per prescription (116.20 INR). Therefore, the average cost borne by patients was 6 times more as compared to cost borne by hospital pharmacy. The cost paid by the patient was significantly higher than that paid by the Hospital pharmacy ($p < 0.0001$). Study conducted by Goyal et al. (2008) also showed similar results.

Table 3. Correlation between total cost, Hospital pharmacy cost and Outside pharmacy cost with Socioeconomic score of the patients

Sr. No.	Correlation	Spearman's Rho
1.	Total cost of prescription	-0.130*
2.	Hospital pharmacy cost of prescription	-0.031*
3.	Outside pharmacy cost of prescription	-0.120*

(*= $p < 0.01$)

The amount spent by the patients on medications was viewed in isolation. Other expenditure such as cost of travel, and the time and money spent in seeking other services also added to the overall burden. In a developing country like India, patient compliance is primarily dependent on the cost of treatment (Gupta et al., 1997). The different costs (Hospital pharmacy cost, Outside pharmacy cost and total cost) were correlated by Spearman's Rho test. The total cost of prescription was inversely correlated with the socioeconomic score of the patient (Spearman's Rho = -0.130, $p < 0.01$), as majority of the patient of lower middle class had to spend money out of pocket (Table 3). The hospital pharmacy cost was inversely correlated with the socioeconomic score of the patient [Spearman's Rho = -0.031, $p < 0.01$] indicates that the hospital scheduled drugs were available but majority of drugs were prescribed from outside. The outside pharmacy cost of prescription (Spearman's Rho = -0.130, $p < 0.01$) as well as cost paid by the patients (Spearman's Rho = 0.408, $p < 0.001$) had a negative correlation with the socioeconomic score as the drugs were prescribed irrespective of the socioeconomic class (Table 3). Thus prescribing decision in our study was not influenced by the financial status of the patient.

The limitation of our study was that it was one time cross sectional and while calculating cost of treatment, we did not measure the actual direct costs and indirect costs. Direct costs involve cost of the drugs, cost of traveling, taking time off from work for the patient (if employed) (Sharma et al., 2006). Among the direct costs, hospital and outpatient expenses form the bulk (Swaminath, 2008).

4. CONCLUSION

To conclude the prescription should be rational and hospital guidelines should be followed in consideration of patient's financial status. The prescription audit can be an eyeopener for the prescribers. There is dire need for physicians training with regards to rational use of drugs and pharmacoeconomics. The hospital administration can look into issues in the hospital by continuous monitoring the prescriptions and hence make the essential drugs available. The actual direct costs and indirect costs were not studied, which is the limitation of this study.

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