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Drug utilization pattern and cost analysis of anti-fungal drugs used in dermatology OPD of a tertiary care teaching hospital (UCMS): A prescription survey

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Abstract
Aim of The Study: The present study was designed to determine the drug utilization pattern and cost analysis of anti-fungal drugs used in dermatology OPD of a tertiary care in teaching hospital (UCMS).
Materials and methods
Study Design: Prospective, observational study, cross sectional study
Study Site: Dermatology department of tertiary care at UCMS Teaching hospital
Sample Size: Minimum 200 patients
Study Duration: November 2016 to January 2017
After taking Ethics committee's permission, prescriptions of 200 patients attending Dermatology OPD, were audited. The prescriptions were analyzed for common skin conditions drug utilization and cost analysis.
Results: This prospective, record based, observational study was carried out in Dermatology department in UCMS from November 2016 to January 2017. Patients diagnosed with fungal disorder by dermatologist were included in study as per inclusion Criteria. Data were collected and analyzed for drug utilization pattern, prescribing indicators and cost. Total 200 patients were included for the analysis. Combination therapy was most commonly prescribed than monotherapy. Most commonly prescribed antifungal agent was Ketoconazole 125 (19.65%) Itroconazole (13.36%) and Antihistaminic agent was levocetrizine 89 (13.99%). Average number of drugs prescribed per encounter was 3.18%. Drugs prescribed by generic name was 0%. Percentage of drugs prescribed from national list of essential medicine was 38.88%. Antifungal drug was available some % discount on outside pharmacy but not on hospital pharmacy.
Conclusion: The dermatological prescription analysis gives a message to the prescribing Physician to achieve rational, cost effective medical care and will be prescribed by generic name.

Keywords: Antifungal agents, Drug utilization study, prescribed daily dose and cost analysis

Introduction

General Background

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 [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]**.** Skin diseases in developing countries have a serious impact on people's quality of life [5].Some of the common skin disorders include eczema, psoriasis, acne vulgaris, pruritus, alopecia areata, decubitus ulcer, urticaria, scabies, fungal skin diseases, impetigo, abscess, and other bacterial skin diseases, cellulitis, viral warts, molluscum contagiosum, non-melanoma skin cancer, pyoderma, dermatitis etc.[3]

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 superiority of prescription and reduce the hazard of irrational prescribing which has become a global phenomenon [6]**.**

Fungal infections are extremely common in the tropical region like Nepal, India and some of them are serious and even fatal. These infections usually occur as a result of decrease in natural defenses (immune compromised state, critically ill, advanced age, use of immunosuppressive drugs) or opportunistic heavy exposure to the fungus. Fungal infection is due to the countries hot and humid climatic conditions, economic (poor hygiene) and social (overcrowding) are known to adversely influence the course of the infections. These fungi have the capability to produce keratinase, which allow them to metabolize and live on human keratin like skin, hair and nail. They produce diverse human infections ranging from superficial skin infection to internal organ invasion (systemic diseases).Superficial fungal infections are not life threatening, but associated with a significant decrease in quality of life. They can be very uncomfortable and may spread to other individuals or become invasive. Most of the superficial and subcutaneous fungal infections are treated by antifungal drugs but the cases of resistance are on the rise [7, 8]**.**

The antifungal drugs presently available fall into these categories – oral or parental for systemic infections, oral and topical drugs for mucocutaneous infections [9]**.** Amphotericin B was the only effective antifungal drug available for systemic use for a number of years, but

because of toxicity and drug resistance; now its use is limited [10,11]. There has been a major increase in the prescription of antifungal agents after the introduction of fluconazole into the market in the late 1980s, and again in late 1990s [12].So, pharmacotherapy of fungal disease has been revolutionized by the introduction of the relatively nontoxic oral drugs, combination therapy and new formulations of older agents. Unfortunately, the appearance of azoles resistant organisms, as well as the rise in the number of patients at risk for mycotic infections, has created new challenges [9].

As per WHO, Drug utilization studies or research are powerful exploratory 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 [15]. 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 favorable 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 [16-18].

The evaluation of drug use in given health care against predetermined criteria and standards is fundamental to assess the appropriateness of drug therapy. Moreover, these studies create a sound socio-medical and health economic basis for healthcare decision making. According to World Health Organization (WHO) drug utilization studies serve as an important marker to measure the clinical and inappropriate drug use over the time and as a control tool in health facilities as well as to measure the effect of a therapeutic intervention [19, 20].

The data regarding pattern of drug used in Nepal, particularly in dermatology department are very limited. Among these, many of which draw on previously unavailable prescription claims databases. Thus, I aimed to update this review. Hence, this study was carried out to find out and evaluate the drug utilization pattern and cost analysis of anti-fungal drugs used in dermatology department.

Materials and methods

Study Design: Prospective, observational study, cross sectional study

Study Site: Dermatology department of tertiary care at UCMS Teaching hospital

Sample Size: Minimum 200 patients

Study Duration: November 2016 to January 2017

Methods

Eligibility Criteria

1.1 Inclusion Criteria

- Newly diagnosed cases attending outpatient department of Dermatology
- Follow up patient

1.2 Exclusion Criteria

- Psychiatric patient with skin disorder
- Ward admit patient with skin disorder
- Severely burn patient

1.3 Data collection method and tool: Data will be collected by reviewing prescription paper and required information will be recorded using a structured data collection sheet prepared for study.

1.4 Data processing and analysis: The collected data was analyzed and was filled using MS Excel 2013. Descriptive values were presented as mean values and percentages. Aiming to evaluate the conditions of the services offered to the population concerning medication, we will use World Health Organization (WHO) developed Medication Use standard Indicators, including Prescription Indicators which are as follows:

1. Total number of drugs prescribed
2. Average no of medication per prescription
3. Prescribed dosage form, dose, frequency and duration of administration
4. Percentage of medication prescribed with generic name
5. Percentage of prescribed drugs from list of essential drugs
6. Percentage of prescribed antibiotics
7. Percentage of prescribed injectable drugs
8. Average total cost per prescription (per day/month)
9. Average price per prescription within hospital pharmacy
10. Average price per prescription outside pharmacy

Procedure

- Permission was taken from the research Institutional review committee of UCMS.
- Consent form was signed to the skin disease patient as an approval.
- This prospective study was carried among dermatological disorder patient attending the tertiary care hospital by assessing patient's records and prescription from dermatology department.
- The prescription sheet of skin diseases patients, was analysed individually.
- The data entry was started immediately after the completion of data collection.
- The collected data were checked, verified and then it was entered into the data sheet.
- Data was analysed manually/by using MS excel 2013.
- The test statistics used to analyse the data was descriptive statistics.
- The prescriptions was analysed with the help of descriptive statistics and results was expressed in percentage.

Results

From 20th November 2016 to 14th February 2017. Out of total patients with fungal infections of skin, out of those 200 patients with fungal disorder. Among them 87(43.5%) most common age group of 16-30 years. Total number of males and females among all patients were 119 (59.50%), 81 (40.50%) respectively.

Table 1: Socio demographic description (gender)

Sex	No. of patient	Percentage
Male	119	59.5 %
Female	81	40.5 %
TOTAL	200	100 %

The no. of male patients is greater than female patients.

Table 2: Socio demographic (Age group)

Characteristics(age group)	No. of patient	Percentage
0 – 15	23	11.5 %
16 -30	87	43.5 %
31 -45	63	31.5 %
46 -60	20	10 %
61 -75	5	2.5 %
>75	2	1 %
TOTAL	200	100 %

Patients of age group (16-30) years are highest in no. whereas patient's > 75 years are lowest in number.

Table 3: Fungal Infections

Diagnosis	No. of patient	percentage
Tinea cruris	83	41.5%
Tinea corporis	58	29%
Tinea incognito	38	19%
Tinea facei	12	6%
Tinea capitis	3	1.5%
Tinea pedis	2	1%
Furuncle	2	1%
Orictomycosis	1	0.5%
Pityriasis versicolor	1	0.5%
Total	200	100 %
Tinea cruris	83	41.5%

Most number of patient's are infected by *Tinea cruris*.

Table 4: Different types of dosage form

Dosage forms	Total no. of drugs	Percentage (%)
Tablet	284	44.65
Capsule	78	12.26
Ointment	54	8.49
Cream	73	11.47
Lotion	36	5.66
Soap	85	13.36
Powder	26	4.08
TOTAL	636	100

Tablets are most commonly prescribed among

Table 5: 19th WHO model list of essential medicine

List of drugs	No. of drugs	Percentage
Essential list of Medicine	7	38.88 %
Non-essential list of medicine	11	61.88%
Total	18	100%

Table 6: Route of drug administration

Route Of Administration	No. of drug	Percentage
Oral	362	56.91%
Topical	274	43.08%
TOTAL	636	100

Table 7: Prescribed Drug

S.n	Drugs	Frequency	Percentage
1	Ketoconazole	125	19.65%
2	Levocetrizin	89	13.99%
3	Itroconazole	85	13.36%
4	Terfenadin	82	12.89%
5	Hydroxyzin Hcl	79	12.42%
6	Triclosan 0.5%	64	10.06%
7	Terbinafin	33	5.18%
8	Butenafin	25	3.93%
9	Fusidic acid +Hydrocortison	12	1.88%
10	Fluconazole	11	1.72%
11	Loratidine	8	1.25%
12	Fexofenadin	5	0.78%
13	Cefedoxim	5	0.78%
14	Griseofulvin	4	0.62%
15	Cefexime	3	0.47%
16	Avobenzone + oxybenzon	3	0.47%
17	Amoxicillin+Clavulanic Acid	3	0.47%
18	Mupirocin	3	0.47%
	Total	636	100%

Table 8: Classification of drug was prescribed

S.n	Classes of drugs	Name of drugs	No. of drugs	Percentage
1	Antifungal drugs	Itroconazole, Fluconazole, Ketoconazole, Terbinafine, Butenafine, Griseofulvin, Mupirocine	281	44.18%
2	Antihistaminic	Levocetrizine, Terfenadine, Fexofenadine, Loratadine, Hydroxyzin HCL	260	40.88%
3	Antibiotic	Cefexime, Cefodoxime, Amoxicilline+clavulanic acid, Avobenzone + oxybenzon, Triclosan 0.5%, Fusidic acid, Fusidic acid + Hydrocortison	95	14.93%
	Total	18	636	100%

Table 9

Indicators	Number
Total number of prescriptions	200
Total number of drugs prescribed	636
Average number of drugs prescribed per encounter	3.18
Average number of antifungal prescribed per encounter	2.02
Average number of antihistaminic prescribed per encounter	0.77
Average number of topical antifungal drugs prescribed per encounter	1.37
Percentage of drugs prescribed by generic drugs	0%
Percentage of drugs prescribed from NLEM	38.88%
Total number of prescriptions	200

Conclusion

The therapy provided in the above prescriptions were efficacious but there is a need to emphasize to all prescribers to adhere to the prescription format, to keep the average number of drugs per prescription as low as possible, encourage prescribing by generic name and from essential drug list which should be updated regularly and made available to all the physicians. Proper dosage form, frequency of administration and duration of therapy should be mentioned in all prescriptions to reduce the cost of treatment. Various intervention strategies like introduction of hospital formulary, essential drug list and prescription control (setting a level up to which a particular prescriber can be permitted to prescribe anti-microbial, immunosuppressant etc.) by institutional regulatory authorities should be planned. There is a clear need for development of standard treatment guidelines and educational initiatives to encourage the rational and appropriate drug use. This study suggests that there is immense scope of improvement in prescribing in this department. This study reveals that generic prescription and essential list of medicine is very less and suggests that effort must be made to encourage prescribers for generic prescribing which may have a multitude of benefits including cost effectiveness. The study also suggests that to the patient buy drugs from outside pharmacy to get some percentage discount.

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