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DRUG UTILIZATION EVALUATION AND PRESCRIPTION ANALYSIS FUNGAL INFECTION IN A DERMATOLOGIC DEPARTMENT: A CONCURRENT OBSERVATIONAL STUDY

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ABSTRACT

Background: Fungal infection or Mycoses is usually caused by the parasitic microorganism called fungi that affect skin and mucous membrane along with generation of systemic infections of various internal organs.[8] The degree of fungal infection ranges from superficial infection characterized by involvement of outer layer of the stratum corneum of the skin to deep infection involving the brain, heart, lungs, liver, spleen, and kidneys. Inappropriate use of anti-fungal agents is implicated in the development of anti-fungal resistance and can lead to adverse outcomes like persistent infections, unnecessary exposure, and increased cost. However, data on anti-fungal consumption in high-risk areas is scarce. Such data are essential to address public health problems related to the effectiveness of anti-fungal medications.[32] **Aims and Objectives:** To assess drug usage of Fungal Infection as a tool for ensuring rational drug therapy by using WHO core prescribing indicators. **Methodology:** A concurrent observational study was performed on patients of either gender treated for Fungal Infection at out-patients visiting dermatology department of Dr Sohana's Skin and Laser Clinic, Nadiad after the approval of ethics committee. Drug utilization evaluation was performed using WHO core prescribing indicators. **Results:** 150 patients were involved in this study. The drug utilization study showed that female patients (51.33%) visiting the dermatologic clinic were more as compared to male patients. Most of the patients were in the age group of 21 to 30 years which constitute about 26%. Out of 150 Patients, Tinea Corporis (79.33%) was mostly found fungal infection. 8.66% patients were found of fungal infection with other comorbidities followed by Tinea Cruris. Total 150 Prescriptions contained 456 drugs. Out of which, 292 drugs were antifungal agents and 164 were

supportive drug treatment. The Most common class of anti-fungal agents prescribed were Azoles which includes Luliconazole (29.60%) and Itraconazole (26.31%) etc followed by Antifungal antibiotics such as Griseofulvin (1.53%), Topical antifungal agents such as ketoconazole-zinc Pyrithione (0.43%), and allylamine such as Terbinafine (0.65%). Supportive Treatment includes Anti-Histaminic such as levocetirizine (23.68%), Desloratadine (3.50%) and Vitamins and Minerals supplements. **Conclusion:** Rational use of antibiotics was observed with fungal. It was observed that drugs were not prescribed by generic name in prescription of patients with Fungal disease. Antifungal drugs were not prescribed from NLEM. Thus, to promote rational use of drugs and to encourage evidence-based prescribing, practice of polypharmacy must be reduced, drugs must be prescribed from NLEM and by generic name.

KEYWORDS: Fungal Infection, Drug utilization review, Prescription, Dermatology.

INTRODUCTION

Skin constitutes the largest organ of the human body accounting for about 15% of body. Healthy and attractive skin plays an important role in people's selfesteem.[1] The Skin plays an important role in protecting against pathogens, microorganisms, UV light, dehydration, and mechanical damage.[2] In India the most predominant dermatological condition includes but not limited to dermatitis, urticaria, fungal skin infection, acne, alopecia, and conditions such as psoriasis, skin cancer and adverse drug reaction on the skin are uncommon.[3] Fungal infection caused by the parasitic microorganism called fungi that affect skin and mucous membrane along with generation of systemic infections of various internal organs.[4]

CLASSIFICATION

Based on level of tissue invasion, the fungal infection is classified as superficial, cutaneous, subcutaneous, and systemic or deep fungal infection.

Superficial fungal infection involves invasion of fungi to outermost layer of the skin characterized by increase in skin pH, scaling, redness, and inflammation at the invading site.[5]

When parasitic fungus invades to deeper epidermal layer of skin, develops cutaneous fungal infection also referred as dermatomycoses which involve skin appendages like nails and hairs.[4]

Subcutaneous fungal infection is caused by extension of fungi infection into dermal or subcutaneous region. It is manifested by presence of ulcerated or infiltrated nodular lesion in the infected areas.[4]

Clinical Manifestations

Tinea Versicolor: Usually, asymptomatic.Cosmetic concern about dyspigmentation. Lesions presents for months or year. Macules which are sharply marginated, round, or oval, varying in size. Fine scaling is best intensified by gently abrading lesions. The distribution of lesions is on upper trunk, upper arms, abdomen, neck, axillae, groin, thighs, genitalia.[6]

Tinea Pedis: The most common subtype of tinea pedis, interdigital is manifested as maceration or scale between the toes. Another subtype is hyperkeratotic tinea pedis which is characterized by chronic planter erythema with scaling involving lateral and planter surfaces of foot.[7]

Tinea Capitis: Tinea capitis a predominant infection of scalp and hair occurs in prepubertal children. The three major clinical characteristics of tinea capitis are scaly patches with alopecia, alopecia with black dots at the follicular opening and diffuse scalp scaling with subtle hair loss. A severe form of tinea capitis known as 'KERION' is characterized by tender plaque with pustules and crusting.[7]

Tinea Corporis and Tinea Cruris: Tinea corporis also known as ringworm is a dermatophyte infection on the skin of sites other than face, hands, feet, or groin. Tinea Cruris also known as jock itch and occurs in groin fold. Tinea capitis and tinea cruris are classically presented as annular plaques with central clearing and leading scale.[7]

Tinea Manuum: It is presented with episodic symptoms of pruritis, well demarcated scaling patches, hyperkeratosis, fissures on palmer hand.[6]

Tinea Faciei: It is characterized by well-circumscribed macule to plaque of varying size, elevated border, and central regression. It may appear at any area of the face.[6]

Tinea Unguium: It is also referred to as onychomycosis, a dermatophyte infection of nails. The most common clinical subtype- distal lateral subungual onychomycosis that appear as yellowish or brownish discoloration associated with onycholysis and subungual hyperkeratosis.[7]

Erosio Interdigitalis Blastomycetica (EIB): It is characterized by an oval shaped area of macerated white skin on the web between and extending onto the sides of the finger. It may be presented on hands and feets and most commonly appear between the middle and ring finger and sometimes found between toes.[8]

Treatment

Five common classes of antifungal drugs such as azoles, polyenes, echinocandins, allylamines and pyrimidine analogues are used for superficial and systemic fungal infection.[9]

1. **Polyenes:** Polyenes antimycotics like amphotericin B and Nystatin acts on fungal cell membrane by hydrophobic interactions. It acts by seizing sterols of fungal cell membrane and thereby causing membrane pores and cell death.[9]

2. **Echinocandins:** Echinocandins a semisynthetic lipopeptide includes drugs such as caspofungin, micafungin, anidulafungin. It is potent against candida species and aspergillus species. Echinocandins works by inhibiting 1,3- βD- glucan synthase enzyme coded by FKS family genes which are essential for synthesis of fungal cell wall component and responsible for fungi static activity.[9]

3. **Heterocyclic benzofuran:** A fungistatic drug Griseofulvin belongs to the class of heterocyclic benzofuran which is effective against trichophyton, microsporum and Epidermophyton species. It acts by inhibiting fungal cell mitosis and nucleic acid synthesis. It interacts with microtubules to affect formation of mycotic spindle and inhibit mitosis in dermatophytes.[10]

4. **Antimetabolite:** It includes drugs like flucytosine a pyrimidine analogue which is effective against candida species and cryptococcus species. It affects nucleic and protein synthesis after entering through cytosine permeases and deaminated to 5-fluorouracil.[9]

5. **Azoles:** Drugs included in azole class are imidazoles (ketoconazole, Clotrimazole, luliconazole and oxiconazole) and triazoles (fluconazole and itraconazole) have been the fortunate backbone in making large number of antifungal compounds available for clinical use. They are effective against Candida species and other fungal pathogens attractive due to affability of administration through different routes. It inhibits sterol 14α-demethylase, an essential enzyme in sterol biosynthesis and converts lanosterol to

ergosterol, a vital component for maintaining stability and fluidity of fungal cell membranes.[9]

6. **Allylamine:** Drugs included terbinafine which inhibits squalene epoxidase that converts squalene to lanosterol.[9]

7. **Topical agents:** It includes drugs such as tolnaftate, undecylenic acid, benzoic acid, ciclopirox olamine. It works by interrupting active membrane transport of essential cellular precursors and thereby disrupt cell function and leading to collapsing fungus.[11]

Reasons For Conducting Drug Utilization Review For Anti-Fungal Includes

Inappropriate use of anti-fungal agents is implicated in the development of anti-fungal resistance and can lead to adverse outcomes like persistent infections, unnecessary exposure, and increased cost. However, data on anti-fungal consumption in high-risk areas is scarce. Such data are essential to address public health problems related to the effectiveness of anti-fungal medications.[12]

MATERIALS AND METHODS

This was a concurrent Observational study conducted at Dr. Sohana's Skin and Laser Clinic, Nadiad, Gujarat from October 2022 to April 2023. Total 150 patients were selected randomly attending OPD of fungal infection, after fulfilling defined eligibility criteria.

Inclusion Criteria

1. Patients of age: ≥ 5 years
2. Patient of either gender (males, pregnant, non-pregnant and lactating women).
3. Patient who willingly gives their concern.

Exclusion Criteria

1. Patients with protozoal and viral skin infection.

The study protocol was submitted, and permission was obtained from Institutional Ethics Committee – Charusat before commencement of the study. For studying drug utilization pattern the following data was collected: 1) Age 2) Gender 3) Route of administration 4) History notes 5) Treatment charts 6) Distribution of patient with occupation.

WHO prescribing core indicators was used in the study to determine rationality of prescriptions. These includes a) Average number of drugs per encounter b) Percentage of

drugs prescribed by generic name c) Percentage of encounter with an antibiotic prescribed d) Percentage of drugs prescribed from essential drug list. All this information was collected in self-designed Case report form. After data collection, case data was entered in Microsoft Excel sheet and the collected data was analyzed by using WHO Core prescribing indicators to determine the drug use and rationality of prescription.

a) Average number of drugs per encounter

- Purpose: To measure the degree of polypharmacy
- Calculation: Average = Total number of different drug product prescribed/Number of encounters surveyed. Percentage of drugs prescribed by generic name:
- Purpose: To measure the tendency to prescribe by generic name
- Calculation: Percentage = Total number of drugs prescribed by generic name/Total number of drugs prescribed × 100.

b) Percentage of encounters with an antibiotic prescribed

- Calculation: Percentage = Total number of patients receiving antibiotics/Number of encounters × 100

c) Percentage of drugs prescribed from essential drug list or formulary

- Purpose: To measure the degree to which practices conform to a traditional drug policy, as indicated by prescribing from the national essential drugs list or formulary for the type of facility surveyed.
- Calculation: Percentage = Number of products prescribed which are listed on the essential drug list or formulary/Total number of products prescribed × 100.

RESULTS

Table 1: Age Wise Distribution Of Fungal Disease.

Age group (Years)	Total number of patients(n)	Percentage (%)
1 to 10	3	2%
11 to 20	22	14.67%
21 to 30	39	26%
31 to 40	34	22.67%
41 to 50	22	14.67%
51 to 60	21	14%
61 to 70	7	4.67%
71 to 80	2	1.34%
Total(N)	150	100%

150 patients were enrolled in this study.

The age of patients included in this study were from 5 to 80 years, with a mean age of 18.75±12.92. According to the age group the patients were divided as 1 to 10(n=3), 11 to 20(n=22), 21 to 30(n=39), 31 to 40(n=34), 41 to 50(n=22), 51 to 60(n=21), 61 to 70(n=7), 71 to 80(n=2) as shown in above table.

Table 2: Demographic data according to Gender.

Gender	Number of patients(n)	Percentage (%)
Male	73	48.67%
Female	77	51.34%
Total(N)	150	100%

The study shows that the percentage of female patients visiting dermatologist clinic for Fungal Diseases were more as compared to male patients. The demographic data shows that out of 150 patients, 77 (51.33%) were females and 73 (48.66%) were males.

Table 3: Occupational Details of Study Population.

Occupation	Total number of patients(n)	Percentage (%)
Home makers	54	36
Unskilled labourers	30	20
Students	27	18
Skilled labourers	26	17.34
Business	13	8.67
Total(N)	150	100

According to occupation, the patients were divided into students (n=27), Skilled Labourers (n=26), Unskilled Labourers (n=30), Business (n=13), Home Makers (n=54). Above study shows that Home Makers (36%) were mostly affected with fungal infection followed by unskilled labourers (20%).

Table 4: Fungal Infection Categorization.

Fungal Infection	Number of patients(n)	Percentage (%)
Tinea Corporis	119	79.33
Fungal with other comorbidities	13	8.67
Tinea Cruris	5	3.33
Tinea Faciei	4	2.67
Tinea Versicolor	3	2
Erosio Interdigitalis Blastomycetica	3	2
Tinea Capitis	1	0.67
Tinea Mannum	1	0.67
Tinea Pedis	1	0.67
Total(N)	150	100

Out of 150 Patients, Tinea Corporis (79.33%) was mostly found fungal infection. 8.66% patients were found of fungal infection with other comorbidities followed by Tinea Cruris (3.33%) and Tinea Faciei (2.66%), Tinea Versicolor (2%), EIB-Erosio Inter digitalis Blastomycetica (2%).

Table 5: Route of Administration of Antifungal Agents.

ROA	Number of Patients	Percentage (%)
PO	272	59.64%
Topical	183	40.13%
Sublingual	1	0.21%
Total	456	100%

Oral Drugs (59.64%) were most prescribed followed by Topical agents (40.13%) and Sublingual drug (0.21%) in treatment of fungal infection.

Table 6: Antifungal Agents.

Drugs	Total Number of Drugs	Percentage (%)
Luliconazole	135	29.60%
Itraconazole	120	26.31%
Levocetirizine	108	23.68%
Supportive treatment	40	8.77%
Desloratadine	16	3.50%
Griseofulvin	7	1.53%
Ciclopirox	6	1.31%
Oxiconazole	4	0.87%
Ketoconazole	4	0.87%
Clotrimazole and its combination	4	0.87%
Fluconazole	3	0.65%
Terbinafine	3	0.65%
Fluticasone Propionate	2	0.43%
Ketoconazole and zinc pyrithione	2	0.43%
Ciclopirox and zinc pyrithione	1	0.21%
Sertaconazole and beclomethasone	1	0.21%
Total	456	100%

Total 150 Prescriptions contained 456 drugs. Out of which, 292 drugs were antifungal agents and 164 were supportive drug treatment. The Most common class of anti-fungal agents prescribed were Azoles which includes Luliconazole (29.60%), Itraconazole (26.31%), Oxiconazole (0.87%), Clotrimazole (0.87%), Fluconazole (0.65%) followed by Antifungal antibiotics such as Griseofulvin (1.53%), Topical antifungal agents such as ketoconazole-zinc Pyrithione (0.43%), Ciclopirox-zinc Pyrithione (0.21%) and allylamine such as Terbinafine

(0.65%). Supportive Treatment includes Anti-Histaminic such as levocetirizine (23.68%), Desloratadine (3.50%) and Vitamins and Minerals supplements.

Table 7: Types of Prescription of Fungal Diseases.

Type of Prescription	Number of drugs (n)	Percentage (%)
Monotherapy	431	96.42
Fixed Dose Combinations	16	2.51
Total number of drugs (N)	447	70.28

Study showed 431 (96.42%) drugs were prescribed as a monotherapy and 16 (2.51%) drugs were prescribed as FDCs.

Table 8: Antifungal Drugs Prescribed As Monotherapy.

Monotherapy	Number of drugs (n)	Percentage (%)
Luliconazole	135	31.32%
Itraconazole	120	27.84%
Levocetirizine	108	25.05%
Supportive agents	23	5.33%
Desloratadine	16	3.71%
Griseofulvin	7	1.62%
Ciclopirox	6	1.39%
Oxiconazole	4	0.92%
Ketoconazole	4	0.92%
Fluconazole	3	0.69%
Terbinafine	3	0.69%
Fluticasone Propionate	2	0.46%
Total (N)	431	100%

In this study Luliconazole was most prescribed antifungal agent accounting 31.32% by topical route as monotherapy followed by Itraconazole accounting 27.84% by oral route. Levocetrizine and Desloratidine prescribed as antihistamincs account 25% and 3.71% respectively followed by 5.33% of supportive agents (vitamins and mineral supplements). Other antifungal agents prescribed as monotherapy were found to be Griseofulvin (1.62%), Ciclopirox (1.39%), Oxiconazole (0.92%), Ketoconazole (0.92%), Fluconazole (0.69%), Terbinafine (0.69%) and Fluticasone Propionate (0.46%).

Table 9: Antifungal Drugs prescribed as Fixed Dose Combinations.

Fixed dose combinations	Total number of drugs (n)	%
Ciclopirox and zinc pyrithione	1	6.25
Sertaconazole and beclomethasone	1	6.25
Ketoconazole and zinc pyrithione	2	12.5
Clotrimazole and its combination	4	25

Supportive treatment	8	50
Total (N)	16	100

In this study 50% of supportive drugs FDCs were prescribed followed by Clotrimazole and its combinations (25%), Ketoconazole and Zinc Pyrithione (12.5%), Sertaconazole and Beclomethasone (6.25%) and Ciclopirox and Zinc Pyrithione (6.25%) respectively.

Table 10: Result of Anova With Tukey's Multiple Comparisons.

One-way ANOVA with Tukey's Multiple Comparisons Test was performed to identify the significant difference between the treatments given in different fungal infections. Above table shows that there is no significant difference between treatment given for different fungal infections which increases the risk of drug resistance.

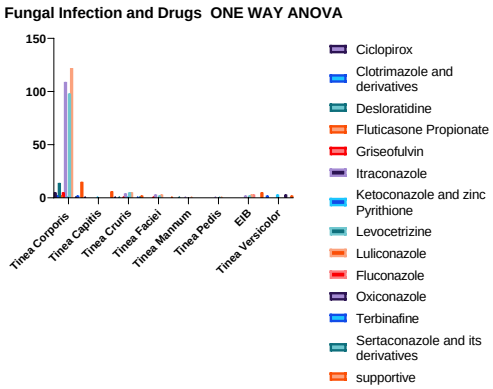

Table 11: Who Core Prescribing Indicators.

WHO CORE PRESCRIBING INDICATORS	Results
Average number of drugs per encounter	3.2
Percentage of drugs prescribed by generic name	0%
Percentage of encounters with an antibiotic prescribed	5.33%
Percentage of drugs prescribed from NLEM	30.76%
Percentage of an encounters with an injection prescribed	0%
Average number of antifungals prescribed per encounter	0.98
Average number of systemic antifungal drug prescribed per encounter	0.9
Average number of topical antifungal drug prescribed per encounter	1.03
Average number of antihistaminic per encounter	0.83

Repeated measures ANOVA summary	
Assume Sphericity?	No
F	1.197
P value	**0.3104**
P value summary	ns
Statistically significant (P < 0.05)?	No
Geisser - Grrenhouse 's epsilon	0.07732
R squared	0.1460

Data summary	
Number of treatments (columns)	14
Number of subjects (rows)	8
Number of missing values	0

Total 456 drugs were utilized for treating 150 patients. As per WHO Core prescribing indicators, Average number of drugs per encounter was found to be 3.2±0.94 that was not within the limit of WHO standards which indicates polypharmacy that leads to poor compliance and increase the cost of the therapy. Percentage of drugs prescribed by generic name was 0% which increase the risk of dispensing errors. Percentage of an encounters with an antibiotic prescribed were found to be 5.33% which is within the limit of WHO standards. Percentage of drugs prescribed from NLEM were 30.76% which is lesser than optimal value of WHO standards and that increases the chances of prescribing incorrect dosage form, strength, and least cost-effective drugs. Percentage of an encounter with injection prescribed was found to be zero. Average number of antifungals prescribed per encounter was found to be 0.98. Average number of systemic antifungal drug prescribed per encounter was found to be 0.9. Average number of topical antifungals drug prescribed per encounter was found to be 1.03. Average number of antihistaminic per encounter was found to be 0.83.

DISSCUSSION OF FUNGAL INFECTION

Age wise distribution was analysed and it was found that most of the prescription were in the age group of 21 to 30 years (26%), followed by 31 to 40 years (22.6%) which is similar to the study result conducted by BN Vegada et al. (2015)[13] in which the most of the prescription were in the age group of 16 to 30 years.

The study on Drug Utilization of antifungal agents had revealed that the overall study population was predominantly female population. The study result shows that 51.34 % patients were female, and 48.67 % patients were male. In a similar study conducted by Amiri Reza et al. (2022)[14] majority of patients were found to be female.

Most of the fungal infection patients were homemakers followed by Unskilled Labourers accounting 36 % and 20% respectively. In a similar study carried out by BN Vegada et al. (2015)[13] also showed that homemakers were majorly affected accounting 38. 2% followed by unskilled labourers accounting for 28.4%. In contrast the study conducted by Jay Shah (2022)[15] revealed that majority of fungal infection were found in students accounting 54% followed by homemakers accounting for 24 Most common fungal infection in study

population was Tinea Corporis accounting 79.3%. In a similar study conducted by Rashmeen Naaz et al. (2021)[16] revealed that Tinea Corporis was most found fungal infection estimating 33% followed by Tinea Cruris estimating 25.8%. In a contradictory study carried out by Pretty Bansal et al. (2021)[17] reported that most common fungal infection was found Tinea Cruris estimating 41.5% followed by 38% of Tinea Corporis.

This study manifested that mostly drug was prescribed by oral route accounting 59.6% followed by Topical route accounting 40.1% and sublingual accounting 0.21%. In a similar study conducted by Pooja Deb et al. (2003)[18] concluded that most common route of administration was oral accounting 64.8% followed by topical route 58.4%.

From the analysis of 150 prescriptions of fungal diseases it was found that the most prescribed topical antifungal agent was Luliconazole estimating 29.6% followed by oral antifungal agent Itraconazole estimating 26.3% In a contrast study conducted by Amiri Reza et al. (2022)[14] concluded that Ketoconazole soap was most prescribed antifungal drug. In this study 431 (96.42%) drugs were prescribed as a Monotherapy and 16 (2.51%) drugs were prescribed as FDCs whereas the study carried out by BN Vegada et al. (2015)[13] revealed that 95.92% drugs given in FDCs followed by 4.08% as Monotherapy. In this study 20.60% of Luliconazole was most prescribed antifungal drug by topical route as Monotherapy followed by 26.31% of Itraconazole orally as Monotherapy. Similar study conducted by BN Vegada et al. (2015)[13] revealed that Clotrimazole was most common drug prescribed by topical route and Fluconazole was most common drug prescribed by oral route as monotherapy.

This study showed that 50% of FDCs were from supportive drug therapy and 50% FDCs were from antifungal agents out of which Clotrimazole, and its combinations were most prescribed antifungal FDC accounting 25% followed by ketoconazole and Zn pyrithione accounting 12.5%. Similar study conducted by BN Vegada et al. (2015)[13] concluded that 5.11% of Clotrimazole with Betamethasone and Whitfield's ointment accounting 8.47% were used as Topical FDCs. A total of 150 subjects diagnosed with fungal infection were prescribed total 456 drugs.

Based on who prescribing indicators

1. Average number of drugs per encounter: Average number of drugs per encounter was found to be 3.2 which was not within the limit of WHO standard which indicate the practice of polypharmacy that led to poor compliance and increase the cost of the therapy.

Similar study conducted by BN Vegada et al. (2015)[13] concluded that 3.39 drug per encounter were prescribed and study by Pretty Bansal. (2021)[17] revealed 3.68 drugs per encounter indicating Polypharmacy.

2. Percentage of drugs prescribed by generic name: Percentage of drugs prescribed by generic name was found to be 0% which increase the risk of dispensing error whereas the study by BN Vegada et al. (2015)[13] revealed that 54.33% of drugs was prescribed by generic names and study by Pretty Bansal et al. (2021)[17] revealed 50.33% drugs prescribed by generic names.

3. Percentage of an encounters with an antibiotic prescribed: Percentage of an encounters with an antibiotic prescribed was found within the limit <30% accounting 5.3% which reduce risk of antibiotic resistance.

4. Percentage of drugs prescribed from NLEM: WHO model list of essential medicines/National List of Essential Medicines describes list of minimum drugs for basic health care system, listing most efficacious, safe and costeffective medicines for priority disease conditions. Here, during study period 30.76% of drugs were prescribed from NLEM (2022). In similar study conducted by BN Vegada et al. (2015)[13] revealed that 43.14% drugs prescribed from WHO EDL and 56.86% drugs from NLEM (2011).

5. Percentage of an encounter with an injection prescribed: In this study percentage of an encounter with an injection prescribed were found to be 0 % which was similar to study conducted by BN Vegada et al. (2015)[13] revealed that Percentage of an encounter with an injection prescribed were found to be 0.08 %.

6. Average number of antifungals prescribed per encounter; Average number of systemic antifungal drug prescribed per encounter and Average number of topical antifungal drug prescribed per encounter Average number of antifungal prescribed per encounter was found to be 0.98 out of which Average number of systemic antifungal drug prescribed per encounter was 0.9 and Average number of topical antifungal drug prescribed per encounter was 1.03 which was similar to study conducted by BN Vegada et al.(2015)[13] revealed that Average number of antifungal prescribed per encounter was found to be 2.08 out of which Average number of systemic antifungal drug prescribed per encounter

was 0.98 and Average number of topical antifungal drug prescribed per encounter was 1.10.

7. Average number of antihistaminic drugs prescribed per encounter: Average number of antihistaminic drugs prescribed per encounter was found to be 0.83 which was like study conducted by BN Vegada et al. (2015)[13] revealed that Average number of antihistaminic drugs prescribed per encounter was found to be 0.97.

CONCLUSION

This study conducted in middle of Gujarat concluded that prescribing pattern of Antifungal agents was irrational. By using WHO core prescribing indicators it was revealed that average number of drugs per prescription for Fungal disease was found to be higher. Thus, prescriber must consider factor of polypharmacy. Rational use of antibiotics was observed with Fungal disease. It was observed that drugs were not prescribed by generic name in prescription of patients with Fungal disease. Furthermore, antifungal drugs were not prescribed from NLEM.

Thus, to promote rational use of drugs and to encourage evidence-based prescribing, practice of polypharmacy must be reduced, drugs must be prescribed from NLEM and by generic name.

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