Evaluation of drug use pattern in Central Leprosy Teaching and Research Institute as a Tool to Promote Rational Prescribing

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The present study was undertaken to evaluate the format, prescribing patterns and rationality of the prescriptions of patients attending the Out Patient Department (OPD) of Central Leprosy Teaching and Research Institute (CLTRI) for a period of six months. A total of 4,748 prescriptions was analyzed in which 1,43,456 drugs were prescribed. The patient's name, age, gender, superscription, dosage, duration of therapy and prescriber's identity was written on all prescriptions. Out of all drugs, 95% were from the National Essential Drug List of India. Average number of antibiotic per prescription, in whom it was prescribed, was 3.83. Multivitamins, Minerals and other Supplements (38.53%) were the most common group of drugs written, followed by Corticosteroids (26.06%). Most of the drugs were given by the oral route (96.27%). Dosage and dose schedule of drugs was written for all the drugs. The study showed a tendency of prescribing by generic names and also towards poly- pharmacy.

Key Words : leprosy, prescriptions, rational prescribing

Introduction

Irrational use and prescribing habits lead to ineffective and unsafe treatment, exacerbation or prolongation of illness, distress and harm to the patient and higher costs. (Ambwani and Mathur 2006). Irrational prescription of drugs is commonly observed in clinical practice (Kanakambal et al 2001). Important reasons for irrational use are lack of information about drugs, faulty & inadequate training & education of medical graduates, poor communication and observations by health professionals, lack of diagnostic

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facilities/uncertainty of diagnosis, demand from the patient for rapid cure, defective drug supply system, in effective drug regulation, and unjustified promotional activities of pharmaceutical industries. There is growing movement towards prescription of rational and unjustified combinations (WHO 2015). Monitoring of prescriptions and drug utilization studies can identify the problems and create awareness. It can provide feedback to prescribers to correct the irrational use of drugs (Ambwani and Mathur 2006). Variations in types of drugs used and in the way they are prescribed is considerable even when comparing small adjacent areas and in comparing prescriptions by doctors, working within the same area (Mathur and Dandiya 2004). The present study was undertaken to evaluate the drug prescription & usage pattern in the OPD of CLTRI and suggest remedial measures to make drug therapy more rational.

Material and Methods

The present study was a retrospective analysis of data collected over a period of six months in the OPD of Central Leprosy Teaching and Research Institute (CLTRI), which is a tertiary care leprosy hospital of Tamil Nadu, after approval from the Head of the Institute and Medical Superintendent in charge of the Clinical Division. The prescriptions of all the patients attending the OPD during the period of the study were analyzed. The prescription data were taken from the OPD cards and analyzed for trends in drug use, rationality of prescription along with adherence to prescribed format (NLEM, 2015, Minocha et al 2000). To analyze trends & rationality in prescribing patterns, total number of drugs prescribed, average number of antibiotics per prescription, average number of drugs per prescription, percentage of drugs prescribed from National Essential Drug List (NLEM 2015), Percentage of drugs prescribed by generic name, brand name,

route of administration and physical methods used (if any) were noted. The data was further analyzed for the most commonly prescribed drug group/(s), percentage of oral drugs, topical preparations (as combination application or single preparation) and injectables Furthermore, prescriptions with combination of topical and oral agents, and various cleaning and aseptic agents was also noted. The prescriptions were also assessed for dose, strength, dosage schedule, duration of therapy and use of any banned drug formulations. The standard format of prescription was being used in CLTRI and the same was analyzed for patient identification parameters i.e. name, age, gender etc, superscription (Rx), inscription (drug name, dose and dosage frequency), signa (instructions to patient about drug use), prescriber's identity (name, registration, address of the prescriber) and date of prescription (Sharma and Kapoor 2003).

Statistical analysis : The noting & recording of prescription data and analysis was done by an independent observer (DT) who did not participate in the prescribing decision. The data are presented as mean and percentages.

Results

A total of 4748 prescriptions of patients attending the CLTRI OPD was included for analysis. The findings pertaining to prescription format are shown in Table 1.

All the prescriptions carried the date; name, age, gender and address of the patients as they are already printed as a standard format in prescription slips and on the hospital OPD cards. The superscription Rx, and dosage was mentioned for all the drugs. None of the prescriptions carried instructions to the pharmacist while special instructions to the patient were mentioned in 8.04% prescriptions. Remaining patients were mostly given verbal instructions (Table 1).

Table 1 : The content of the analyzed prescriptions in the study

Contents of the prescription	Number of the prescriptions n (%)
Dates on the prescription	4748 (100)
Name of the patient	4748 (100)
Age of the patient	4748 (100)
Gender of the patient	4748 (100)
Rx	4748 (100)
Signature of the prescriber	4748 (100)
Address of the Patient (Patient OPD cards)	4748 (100)
Special instruction to patients/Pharmacist	382(8.04)
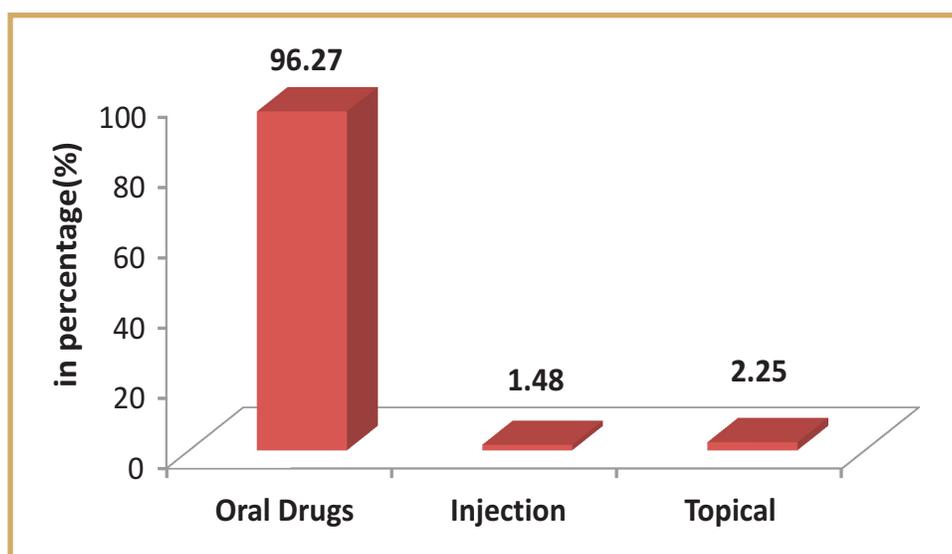
Fig 1 : The percentage of OPD patients prescribed drugs to be taken by the various routes

Dosage, dose schedule and duration of therapy was written for all the drug prescriptions. None of the prescriptions carried any banned drug formulations. Short signatures as prescriber's identity were present in 100% of the prescriptions, but none had the registration number of the prescriber. This was probably, because this is a Central Government hospital OPD and not a private clinic, therefore writing the registration number may not be mandatory.

Patients were prescribed a total of 1,43,456 drugs of which 96.27% were advised to be take the drugs orally, while 2.25% were prescribed drugs to be applied topically and in 1.48% by intramuscular injections (Fig 1).

About 97.79% drugs were prescribed by their respective generic names while proprietary names were only used for 2.20% drugs. Among the oral drugs 99.04% were prescribed generic drugs, among topicals 45.21% and among injec-
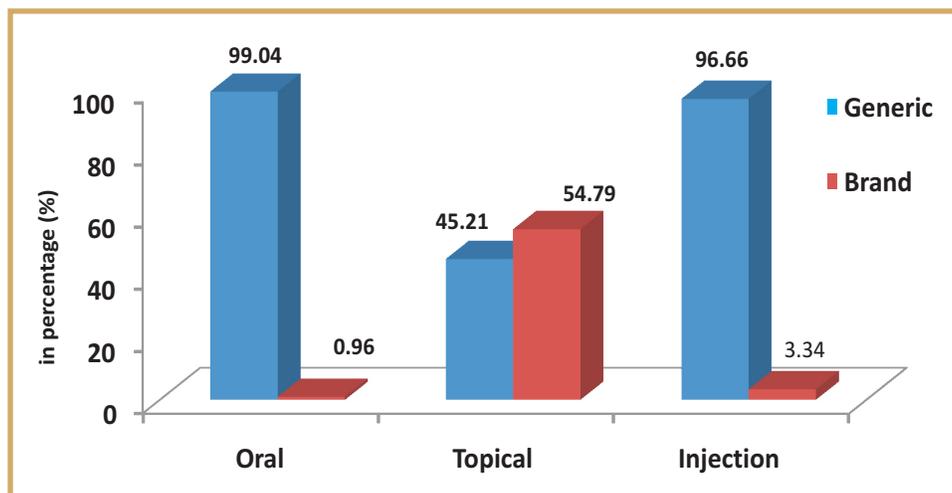
Fig 2 : The percentage of generic drugs and trade name drugs received by the three routes

Table 2 : The various categories of drugs prescribed and their route of a administration

	Oral	Topical	Injectable	Total
Antibiotic	17771 (97.68%)	285(1.57%)	138 (0.76%)	18194(100%)
Analgesics	1831(75.66%)	535(22.11%)	54 (2.23%)	2420 (100%)
Anti acids	15831 (99.85%)		23(0.15%)	15854 (100%)
Antipyretics	11113(98.89%)		125(1.11%)	11238 (100%)
Anti-allergics	31(34.07%)		60(65.93%)	91 (100%)
Anti -parasitic	66(100%)			66 (100%)
Antiemetic			3(100%)	3 (100%)
Anti inflammatory	75(100%)			75 (100%)
Antifungals		180(100%)		180 (100%)
Anti ecto- parasitic		420(100%)		420(100%)
Antiseptic		263(100%)		263(100%)
Antibacterial + steroid		50(100%)		50(100%)
Antibiotic + steroid		60(100%)		60(100%)
Corticosteroid	37353(99.91%)		35(0.09%)	37388(100%)
Bronchodilator	311(84.05%)		59(15.95%)	370(100%)
Prophylactic immunization(TT)			79(100%)	79(100%)
Vitamins, minerals & supplements	53727(97.20%)		1548(2.80%)	55275(100%)
Skin Protectants		1370(100%)		1370(100%)
Cleansing		60(100%)		60(100%)
Total	**1,38,109**	**3223**	**2124**	**1,43,456**

tables 96.68%. were generic drugs respectively, while the rest were Trade mark drugs. (Fig 2).

Among the other drugs prescribed, multivitamins, minerals and other drug supplements (38.5%) were the most common group of drugs advocated, followed by corticosteroids (26.06%) and antibiotics (12.68%). Among the multivitamins, prescribed, 97.2% were prescribed by oral route and 2.8% by the injectable route. A total 37,388 prescriptions were of corticosteroids, of which 99.91% were by the oral route. A total of 18194 anti-bacterials were also prescribed, out of which 97.68% by oral route, 1.57 % topically and 0.76% as by injectable route. (Table 2)

Among the antibiotics, analgesics and multivitamin supplements, 98.66%, 77.81% and 97.59% respectively were percentage of generic drugs prescribed as seen in (Table 3). The rest of the drugs were prescribed by Brand names respectively.

Among the oral drugs, 98.69% were prescribed as a single agent and in 1.31% prescriptions more than one drug combinations were written. On the other hand among topical drug prescriptions only 80.98% were prescribed as singly while in 19.02% in more than one drug was prescribed (Table 4).

Among antibiotics, 88.73% were prescribed as a single antibiotic and 11.26% as fixed dose combinations of different antibiotics. In analgesics 97.73% were used as single drugs and 2.27% as combinations of more than one analgesics.

Among the antibiotics, most commonly prescribed antibiotic was Amoxicillin followed by Metronidazole in oral preparations and Gentamicin injectables (Table 5). The average number of antibiotics prescribed per prescription was 3.83. Antifungals prescribed were 0.12% of prescriptions, all of them (100%) were to be applied as topical locally.

Of the topical application prescriptions, 44% were skin protectants and cleansing agents; 38%

Table 3 : The proportion of common drugs given in the prescriptions by generic and brand names

Category of drugs	Generic (%)	Brand (%)	Total
Antibiotic	17950 (98.66%)	244 (1.34%)	18194 (100%)
Analgesic	1883 (77.81%)	537 (22.19%)	2420 (100%)
Multivitamins / supplements	53944 (97.59%)	1331 (2.41%)	55275 (100%)

Table 4 : Single and combination of drugs prescribed by the different routes

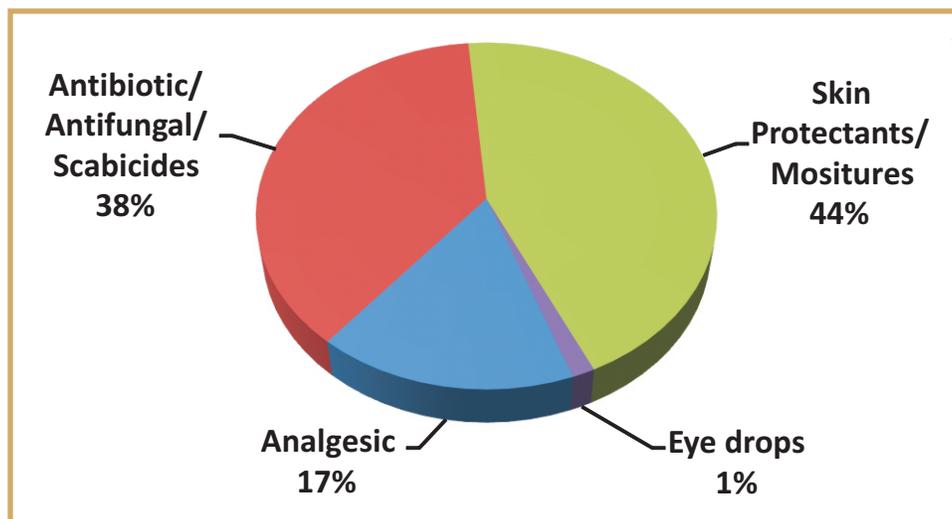| Preparations	Oral	Topical
Single	136297 (98.69%)	2610 (80.98%)
Combinations	1812 (1.31%)	613 (19.02%)
Total	**138109**	**3223**

Fig 3 : The composition and proportion of topical agents prescribed

Table 5 : The pattern of prescriptions of supplementary drugs.

Name of the drugs	Oral	Topical	Injectable	Total number of prescriptions
Single				
Amoxicillin	7807			7807
Metronidazole	5009			5009
Ofloxacin	578			578
Gentamycin		47 (eye drops)	70	117
Ciprofloxacin	1412			1412
Doxycyclin	107			107
Cephalexin	1046			1046
Ciprofloxacin			6	6
Cefotaxime			39	39
Amikacin			20	20
Cefuroxime			3	3
Combination				
Amoxyclox	402			402
Ampiclox	1410			1410
Neosporin Plus	-	238		238

antibacterials, antifungals, scabicides and anti-septics; 17% analgesics and 1% topical eye drops (Fig 3).

Out of all the drugs prescribed, 95% drugs were from the National Essential Drug List of India.

Discussion

A large number of studies on drug utilization and prescription patterns have been carried out in developing countries. However, these studies were conducted in different hospital settings and in various departments of the clinical specialty. This study deals with drug utilization in leprosy hospital. It is probably the first study to evaluate the drug usage and prescription pattern in a National level leprosy Institution and Hospital. The standard MDT regimen used for the treatment of leprosy has been excluded. As this is the first study in a Leprosy hospital settings, comparative studies can be with the Dermatology departments in tertiary care hospitals in India (Badar et al 2002, Maini et al 2002, Minocha et al 2000) who treat leprosy patients visiting their facility. The primary aim was to evaluate the pattern of drug utilization in a Leprosy Institute where treatment of Leprosy and leprosy related co-morbid conditions was given. Careful prescription writing is required also Leprosy Institutions settings. In CLTRI about 800-900 patients were attending OPD for treatment, which include new leprosy cases, follow up cases, treatment and advise for leprosy reactions and non healing ulcer cases. Lepra reactions and non healing ulcer cases contribute the maximal proportion of cases.

The average number of drugs prescribed is an important index of prescription analysis and in the present study, it was 3.83 for antibiotics, analgesics and multivitamins. These findings were not in conformity with other hospital studies done in India which showed 2-3 drugs for each drug groups used, (excluding MDT) per prescription (Nithyanandan et al 2003, Tikooet et al 2011) even without other co-morbid conditions. The average number of total drugs prescribed per prescription was around 30 which is very high. In this study too, the average number of drugs prescribed was 3.83/patient. This high number of drugs prescribed is probably due to the fact that multivitamins and corticosteroids were dispensed for a minimum of 15 days for leprosy reaction patients who attend the OPD from a very long distance. Also at times these conditions are difficult to treat, recur and lead to wage loss and increased morbidity. However, it is still important and preferable to keep the average number of drugs per prescription as low as possible since combinations of multiple drugs and for long usage may lead to increased risk of drug interactions, adverse drug reactions, poor medication compliance and eventually increased cost of prescription. In this study it was observed that both corticosteroids and multivitamins were often prescribed and these were found to cause very little interaction, although these (specially corticosteroids) are notorious for their side effects during prolonged usage.

Regarding antibiotics, only those antibiotics were used to which the patients organisms were sensitive to in CLTRI. The profiles of microorganism and drug sensitivities were used for rational prescription of antibiotics in CLTRI (Pugazhenthan et al 2015). As per practice at the Institute even as empirical treatment, only those drugs are prescribed which were procured on the basis of the study done in CLTRI followed by another if the patient is not responsive.

The dose and dosage schedule were mentioned in all the prescriptions and has lead to a decrease in the overall cost of treatment due to appropriate use of drugs by the patient. The most commonly prescribed drug groups in our study were multivitamins and supplements followed by corticosteroids and anti-bacterials. Analysis of the prescription data revealed that reactions were the most common diagnosis that explains the greater use of corticosteroids. It is evident from the study that there is a small tendency towards polypharmacy in CLTRI for the symptomatic

treatment for severe, recurrent and troublesome symptoms reported by the patients and specially for leprosy reactions.

Among the total number of drugs prescribed, most of them were prescribed by the oral route followed by topicals and injectable routes. Our data was different from the other reported studies (Nithyanandan et al 2003 and Tikoo et al 2011). Prescribing under a generic name is considered economical and rational. In the present study it generic drugs (97.79%) were prescribed in most patients as compared to proprietary drugs (2.20%). Ravishankar et al (2002) reported that only 32.6% of patients were prescribed generic drugs and 67.4% were prescribed brand drugs, in their reported settings. Similarly Tikoo et al (2011) reported (19.3% prescriptions were of generic type and the rest 80.7% were of brand drugs respectively. Better and more prescribing of generic drugs at CLTRI could be due to their availability and importance given to these at the Institute.

Of the total drugs prescribed about only 1.31% were oral drugs with fixed dose combinations and 19.02% were topical combination drugs. Among antibiotics 11.27% were in combinations and 2.27% were topical analgesics combinations. The chronic nature of the disease and multi-modality approach being used makes the use of fixed dose combinations an inevitable option in some patients. The use of fixed dose combinations may help to bring down the cost and improve compliance (WHO 2015).

Drugs from Essential Drug List (NLEM, 2015) constituted about 95% in our study, while it was reported 15.4% (Tikoo et al 2011) and 51% (George kutty et al 2002) in other settings which were dermatology related. Also, almost all the drugs in the present study were procured from the Government Medical Store Depot (GMSD) and other Government of India firms as emphasis has been made on indenting the generic drugs. Under such situations, comparisons may not be meaningful.

Conclusion

The therapy provided in the above prescriptions were apparently rational, were needed and all prescribers adhered to the prescription format, but emphasis has to be made to keep the average number of drugs per prescription as low as possible. Prescribing by generic name and from essential drug list needs to kept at the maximum and this was followed in this case. It is noteworthy to keep in mind that NLEM is updated regularly and was made available to all the at our Institute. As CLTRI is an apex institute in providing teaching and research activities for the undergraduates, postgraduates and other health related pro-fessionals, rational prescriptions were also taught along with teaching and training in leprosy field.

Acknowledgements

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