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PRESCRIBING PATTERNS AND ANALYZING THE USAGE OF CORTICOSTEROID THERAPY AT TERTIARY CARE HOSPITAL

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Abstract

Corticosteroids are used extensively in treating inflammation. They provide short-term symptomatic relief in abnormalities of conditions like Auto immune diseases, Dermatological and Respiratory diseases. Adverse effects of Corticosteroids include Cushing's syndrome, Skin atrophy, contact dermatitis, tachyphylaxis, Myelosuppression, Diabetes mellitus, Hypertension, pleural effusion. As per the sources available from the regulatory authority of Central Drugs Standard Control organization, inappropriate use of Corticosteroids is more commonly practiced in India almost all the drugs are prescribed rationally. The Pharmacist can promote better patient care and drug safety. Most of the Physician is recommending the drugs are mostly branded names. Our study suggests provide it in generic names. Clinical Pharmacists in associations with clinicians must play a crucial role in minimizing the problems associated with irrational usage of corticosteriods.

Introduction

Corticosteroids are used extensively in treating inflammation. They provide short-term symptomatic relief in abnormalities of conditions like Auto immune diseases, Dermatological and Respiratory diseases. Adverse effects of Corticosteroids include Cushing's syndrome, Skin atrophy, contact dermatitis, tachyphylaxis, Myelosuppression, Diabetes mellitus, Hypertension, pleural effusion [1]. For this, prescribing pattern in the rational drug use is used to minimize the local and systemic side effects [2]. Drug treatment plays an important role in modern healthcare system to promote the public health. Prescribing pattern plays a major role in rational drug therapy. The active role of prescription pattern was to promote the rational use of drugs. As per the sources available from the regulatory authority of Central Drugs Standard Control organization (CDSCO), inappropriate use of Corticosteroids is more commonly practiced in India [3-4].

Definition

According to WHO rational drug use is defined as prescribing A Right drug in Right dose, Right in terval Right frequency, appropriate to patients clinical need and available at lower cost.

The concept of rational drug use is age old as evident by the statement made by the Alexandrian physicianHerophillus300.B.C that is "Medicines are nothing but are the very hands of god if employed with the reason and prudence"

Rational drug use attains more significance now days in terms of medical, socio economical and legal aspects. Factors that have led sudden b realisation for rational drug use are:

1. Drug explosion- increase in number of drugs available has incredibly complicated the choice of appropriate drug for particular indication
2. Efforts to prevent the development of resistance- rational use of drug may lead to the premature demise of highly efficacious and lifesaving new antimicrobial due to development of resistance

3. Growing awareness-Today the information about the drug development, its uses and adverse effects travel from one end of the planet to other end with amazing speed through various media.

4. Increased cost of treatment-increase in cost of drug increase economic burden on the public as well as the government. This can be reduced by rational drug use

5. Consumer protection Act-(CPA)- Extension of CPA in medical profession may restrict the rational use of drugs [5].

Reasons for Irrational Use of Drugs

- Lack of information:-Unlike developed countries we do not have regular facility which provides us up to date unbiased information on the certainly used drugs. Majority of our practitioners rely on medical representatives. There are difference between pharmaceutical concern and drug regulatory authorities in the interpretation of the data related to indications and safety of drugs.
- Faulty & inadequate training &education of medical graduates:-Lack of proper clinical training regarding writing a prescription during training period, dependency on diagnostic aids, rather than clinical diagnosis, is increasing day by day in doctors.
- Poor communication between health professionals and patients:-Medical practitioners and others health professionals giving less time to patients and not explaining some basic information about the use of drugs.
- Demand for patients:-To satisfy the patient's expectations and demand of quick relief clinician prescribe drug for every single complaint. Also there is a belief that every ill has a pill all these increase the tendency of polypharmacy.
- Lack of diagnostic facilities\ uncertainty of diagnosis:-Correct diagnosis is a important step towards rational drug therapy. Doctors posted in remote areas have to face a lot of difficulty in reaching to a precise diagnosis due to non-availability of diagnostic facilities.
- Defective drug supply system and ineffective drug regulation:-Absence of well organised drug regulatory authority and presence of large number of drugs in market lead to irrational use of drugs.
- Promotional activities of pharmaceutical industries:-The lucrative promotional programmes of the various pharmaceutical industries influence the drug prescribing [6].

Hazards of Irrational Use of Drugs

Irrational use of drug may lead to

- Ineffective and unsafe treatment
- Exacerbation or prolongation of illness
- Distress &harm to patient
- Increase the cost of treatment [7].

Measures to Promote Rational Drug Use

Medicines cannot be used rationally unless everyone involved in the pharmaceutical supply chain has access to objective information about the drug they buy and use. Knowledge and ideas about the drugs are constantly changing and a clinician is expected to know about the new development of drug therapy. The pre-requisites of rational drug use are –

- Critical assessment & evaluation of benefits & risk of drug used.
- Compare advantages & disadvantages safety & cost of drug with existing drug for some indications.

Obstacles Exist in Rational Drug Use

Various obstacles in rational drug use are-

- Lack of objective information & of continuing education & training in pharmacology.
- Lack of well organised drug regulatory authority & supply of drugs.
- Presence of large number of drugs in market & lucrative methods of promotion of drugs employed by pharmaceutical industries
- The prevalent belief that "every ill has a pill' [8].

Steps to Improve Rtional Drug Prescribing

Step-I

Identify the patient's problem based on symptoms & recognise the need for action.

Step-II

Diagnosis of the disease identifies underlying causes &motivating factors. This may be specific as in infectious disease or not specific.

Step-III

List possible intervention or treatment. This may be non-drug treatment or drug treatment. Drugs must be chosen from different alternatives based on efficacy, convenience & safety of drugs including drug interactions& high risk group of patients.

Step-IV

Start the treatment by writing an accurate and complete prescription e.g. name of the drugs with dosage forms, dosage schedule & total duration of the treatment.

Step-V

Given proper information instructions and warning regarding the treatment given e.g. side effects dosage schedule danger risk of stopping therapy suddenly.

Step-VI

Monitor the treatment to check if particular treatment has solved the patient's problem .It may be:

a. Passive monitoring-done by the patient himself. Explain him what to do if treatment is not effective or if too many side effects occur.

b. Active monitoring done by physician and he make an appointment to check the response of the treatment [9].

Methodology

Aim: The aim of the study is to evaluate the prescribing patterns and analyzing the usage of Corticosteroid therapy

at tertiary care hospital in Nellore District, Andhra Pradesh KIMS Hospital.

Objectives of the Study

- To analyze the medical adherence on corticosteroids among the in-Patient departments.
- To compare medication utilization, including the number and type of corticosteroid drug regimens.
- To identify the medications appropriate to their clinical needs.
- To reduce the inappropriate usage of Corticosteroids' therapy.

Results

Demographic profile and patient characteristics

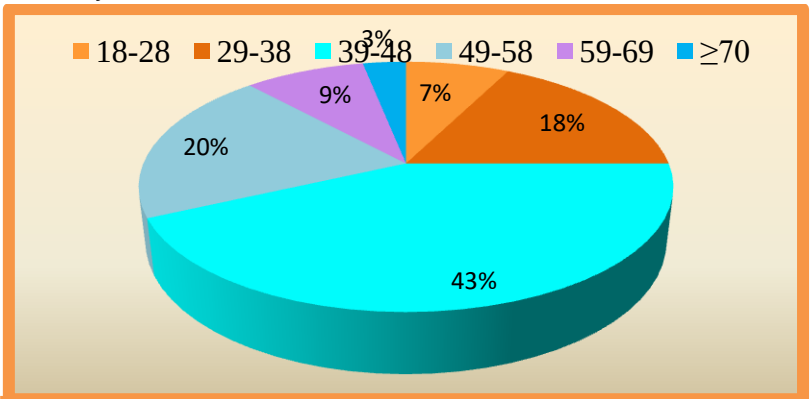
The demographic data & patient characteristics in the general medicine department, orthopaedics department, dermatology department in the hospital was enrolled in the study .In the study ,a total numbers of 160 prescriptions were analysed during the study.

Table: 6 Shows Patient Enrolment received from patients in general medicine ,orthopaedics ,dermatology department classified as per age from Age group 18-28 (7.5%), 29-38 28 (17.5%), 39-48 69(43.50%),49-58 32 (20.00%), 59-69 14 (8.75%),≥70 05(3.1%). & Mean ±Standard deviation 26.5±23.8.

Table :6 Demographics Data & Patient Characteristics' in General Medicine, Orthopaedics ,Dermatology Department

Parameters	Age Group	Number of Prescription	Percentage (%)
Age	18-28	12	7.5%
	29-38	28	17.5%
	39-48	69	43.5%
	49-58	32	20.00%
	59-69	14	8.75%
	≥70	05	3.1%
	Total	Mean ±Standard deviation	26.5±23.8

Pie chart: 1 Shows Prescriptions received from patients in general medicine, orthopaedics, dermatology department shows that Maximum numbers of prescriptions are 69 from the age group 39-48 years. Minimum of the age group are 02 Prescriptions from more than 70 years.



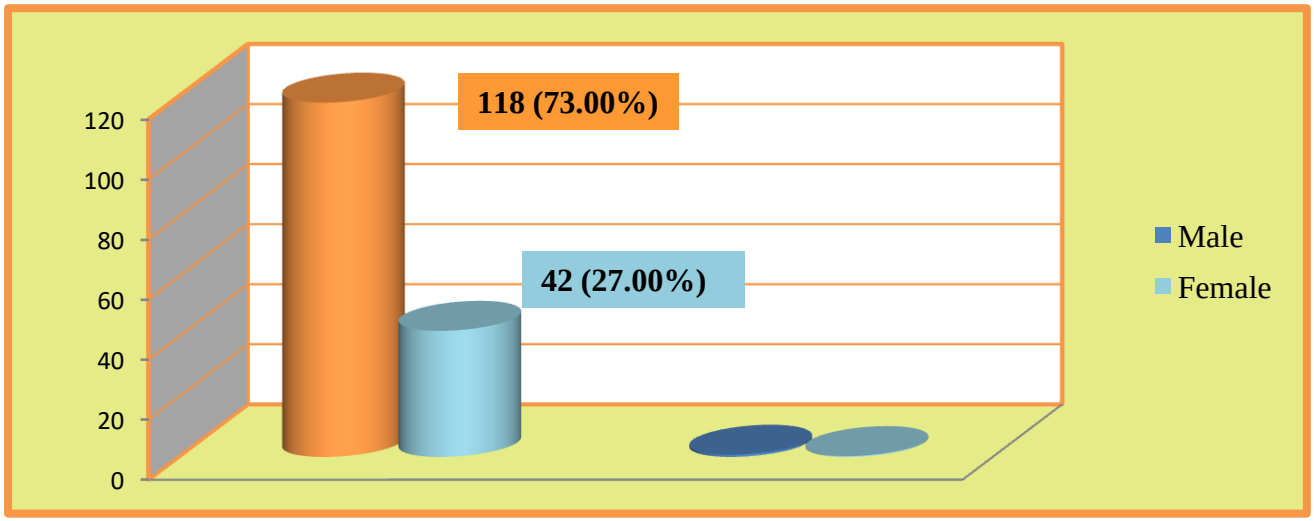
Pie chart 1: Age distribution from all patients in General Medicine, Orthopaedics, Dermatology Department.

Table: 7 Shows prescriptions received from patients classified as per gender variation from the general medicine, orthopaedics, dermatology department of as Males 118 (73.00%), females 42 (27.00%) and Mean ± SD 80 ±53.74.

Table :7 Demographics Data & Patient Characteristics' in General Medicine, Orthopaedics ,Dermatology Department

Parameters	Gender Variation	Number of Prescription	Percentage (%)
Gender Variation	Male	118	73.00%
	Female	42	27.00%
	Total	Mean ±Standard deviation	80 ±53.74.

Column diagram: 1 Shows prescriptions received from patients classified as per gender variation from the department of General Medicine, orthopaedics, dermatology department of as Males 118 (73.00%), females 42 (27.00%) and Mean ± SD 80 ±53.74.

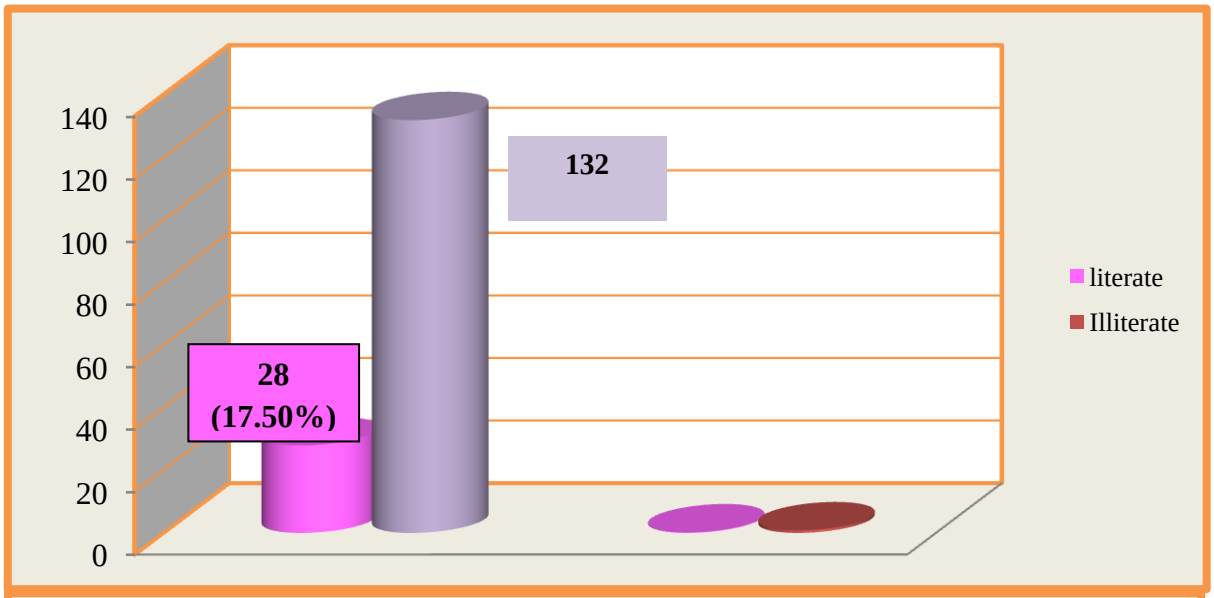


Column diagram 1: Age distribution from all patients in General Medicine, Orthopaedics, Dermatology Department.

Table: 8 Shows educational status received from patients classified as from the general medicine ,orthopaedics ,dermatology department of as literate 28 (17.50%), illiterate 42 (82.50%) and Mean ± SD 80 ±53.74.

Table :8 Gender Variation from the General Medicine, Orthopaedics ,Dermatology Department			
Parameters	**Educational status**	**Number of Cases**	**Percentage (%)**
Educational status	literate	28	17.50%
	Illiterate	132	82.50%
	Total	Mean ±Standard deviation	80 ±73.54.

Column diagram:2 Shows prescriptions received from patients classified as per educational status from the department of General Medicine, orthopaedics, dermatology department of as literate 28 (17.50%), illiterate 132 (82.50%) and Mean ± SD 80 ±73.74. that Maximum numbers of prescriptions are 132 from the Illiterate . Minimum are 28 Prescriptions from literate.

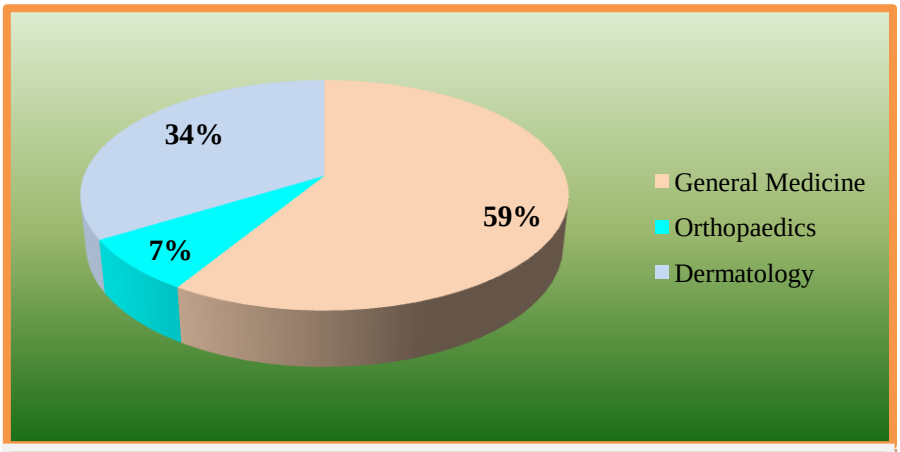


Column diagram 2 : Educational Status from all patients in General Medicine, Orthopaedics, Dermatology Department.

Table: 9 Shows Ward Wise Distribution enrolment of Prescriptions received from patients classified as from the General Medicine 94 (58.7%), orthopaedics 12 (7.5%), dermatology department 54 (33.7%) and Mean ± SD 53.33±41.04.

Table : 9 Ward Wise Distribution Characteristics' in General Medicine, Orthopaedics ,Dermatology Department			
Parameters	**Ward Wise Distribution**	**Number of Prescription**	**Percentage (%)**
Ward Wise Distribution	General Medicine	94	58.7%
	Orthopaedics	12	07.5%
	Dermatology	54	33.7%
	Total	Mean ±Standard deviation	53.33±41.04.

Pie chart diagram:2 Shows prescriptions received from patients classified as per ward wise distribution from the department of General Medicine 94 (58.7%),orthopaedics12 (7.5%), dermatology department 54 (33.7%) of that Maximum numbers of prescriptions are 94 from the General Medicine. Minimum are 12 Prescriptions from Dermatology Department.



Pie chart 2: Ward Wise Distribution from all patients in General Medicine, Orthopaedics, Dermatology Department.

DISCUSSION

Our study target was to know the pattern of usage of corticosteriods in urban & rural areas of Proddatur .hence the study useful to know and verify the prevalent study disease pattern and the utilisation pattern of corticosteriods in General Medicine, Dermatology, and Orthopaedic-Department. Corticosteriods are a first line anti-inflammatory treatment for all respiratory, dermatologic, joint disease [41]. It was very crucial to increase therapeutic efficacy & decrease the adverse effects of drugs. During the 6 months Period, we collected 160 cases and 282 prescriptions with corticosteriods from General Medicine, Dermatology, and Orthopaedic-Department. The data were analysed and summarised accordingly.

As comparative study of Arjan Aryal *et.al.*Study was performed on steroid utilization pattern in a tertiary care hospital. During the 6 months period they audited 226 patients were enrolled in the study where 27.5% were enrolled from the department of dermatology and 72.5% were enrolled from the Department of General Medicines. Male patients were 58.4% and 41.6% were female respectively. In our study, majority of corticosteroid received patients belonged to age group >60 years followed by age group of 51-60 years. This is supported by study conducted in United Kingdom by L J Walsh *et al*.42 Likewise; the social status of our study reported smokers 38.93% and non-smokers 61.07%. This is supported by a study conducted by Dennis Chen *et al* carried out in south Texas who reported 47.7% of their patients to be smokers [43].

The major clinical complaints of the patients admitted in general medicine were related to Respiratory Tract (59.32%) followed by Dermatological complaints (33.18%), Skeletal (5%), Blood Vessel (0.88%) and Neurological (0.88%) which was similar to study done by SanojVarkey *et al* in pulmonary department,44 TP VanStaa *et al* who conducted the study in general medicine department45 and a study done in Maharashtra by Wahane Pravin kumar *et al* who conducted the study in dermatology department.15 Non-infectious skin diseases like psoriasis topped the Table by 29.33%, followed by Eczema (16%), Pemphigus Vulgaris (8%). Infectious disease like fungal infection topped the Table (8%). This disease pattern is comparable to the study conducted by CM Divysanthi *et al* in Karaikal16 which showed similar reports. This shows that the incidence of the skin disease

depends mostly on geographical location, genetic makeup as well as environmental factors.

Majority of patients were prescribed with ultra-high potent class of corticosteroids (59.56%) i.e Clobetasol (48.93%) and Halobetasol (10.63%) in Dermatology department. In spite of the fact that these can cause serious adverse effects, these are easily available and are sold without prescription and also there is very little awareness about the potential side effects in the general public. The most widely prescribed corticosteroids were Budesonide (44.45%), followed by Prednisolone (15.25%), Hydrocortisone (14.9%), Dexamethasone (9.49%) in General Medicine department whereas Desonide (0.33%), Fluticasone (0.33%), Methyl Prednisolone (0.33%) were found to be least in both departments. As far as the indication being concerned, topical Clobetasol was the most prescribed drug for psoriasis. This study is comparable to SP Narwane *et al* [46] Inhaler administration was found to be highest (44.5%) followed by drugs administered through intravenously (24.08%), Oral administration and topical were found to be lowest (15.71%). These all data suggested that among various dosage forms of steroids use, nebulisation was most widely/ frequently used followed by injection, Tablets and topical. This data is supported by Kumar MA *et al* study carried out in Tamil Nadu [47]. We also found out that corticosteroids were never prescribed in any route to treat infectious skin diseases which signifies that the rational prescription is sincerely followed.

It was found out that right steroids were prescribed for right indication to right patients. This assures that rationality is genuinely followed while pre-scribing. However we found some factors deviating from rationality like inappropriate drug history, Drug dose not mentioned, frequency not mentioned, wrong administration, dose omission, illegible hand writing, lack of dose tapering and steroid abuse. Not specifying these factors can lead to under usage of the medication and can lead to sub therapeutic outcome and at the same time excessive usage can lead to unwanted effects.3,10 Few patients were found to be abusing steroids due to lack of knowledge towards medication. Clear instructions should be provided so that the patients are aware on how much steroid should be used and how long it should be used.48Also, Generic name for most of the drugs were not mentioned at all. Using generic names usually provides flexibility to the dispensing pharmacist and generic drugs are less expensive than the branded drugs [49].

Most of the drugs were prescribed for right indication to right patient, however some factors such as in appropriate drug history, improper mentioning of dose & frequency, wrong administration time, dose omission, improper dose tapering etc. were found to be deviating away from the rationality. The use of Steroids is seen more in elderly patients that suggest that elderly patients should be monitored closely while treating them with Steroids.

Prescription related factors of drugs patients data obtained as per General Medicine, Orthopaedics ,& Dermatology Department , that Maximum numbers of prescriptions as Inaccurate History Taken 42 (14.89%) from the disease condition . Minimum numbers of Illegal handwriting 28(9.92%) & Mean ±Standard deviations are 35 ±9.89. steroid usage on steroid abuse characteristics patients data obtained as per General Medicine, Orthopaedics ,& Dermatology Department , that Maximum numbers of prescriptions as steroid not abused 250 (88.65%) from the disease condition . Minimum numbers of steroid abuse 32 (11.34%) & Mean ±Standard deviations are141±154.14.

The Study Reveals it is very important to understand specific aspects of corticosteriods use based on dosage ,duration ,prescribed related factors, administration related factors, assessing the economic burden of corticosteriods use. Corticosteriods are directly available in pharmacies may mislead factors for irrational use of corticosteriods. Irrational use /Abuse of topical or systemic steroids may lead to severe ADRs and affects the quality of life of patients. Future outlook of our research focus on organising workshops/conference for pharmacists on a regular interval basis in order to update and improve their knowledge on safe and rational use of these drugs, as pharmacists play an important role in counselling the patients on this behalf.

Conclusion

1. The prescribing pattern studies provided by clinical pharmacist at the Andhra Pradesh in Nellore District were found to be useful and beneficial to the healthcare professionals.
2. Our study concludes that almost all the drugs are prescribed rationally.
3. The Pharmacist can promote better patient care and drug safety.
4. Most of the Physician is recommending the drugs are mostly branded names. Our study suggests provide it in generic names.
5. Clinical Pharmacists in associations with clinicians must play a crucial role in minimizing the problems associated with irrational usage of corticosteriods.
6. Our Study Concludes Most of The Physician Choice Are Ultra Potency Steriod When Compared Others Potency.
7. In Our Study Mostly Corticosteriods Are Used In Respiratory System In General Medicine.
8. The present study corticosteriods was mostly appropriate according to WHO protocol of standard guidelines.
9. Dosage Adjustment in Patients Maybe Done Based on Therapeutic Drug Monitoring.

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Conflict of Interest
No Conflict of Interest

Inform Consent
Each patients has Consent writing for study

Ethical Statement
Study Reflections ethical statement

Author Contribution
All authors participate in the work

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