Study the Assessment of Prescribing Pattern of Steroids in A Rural Tertiary care Teaching Hospital

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ABSTRACT

Steroids are widely prescribed and used by practitioners due to powerful anti-inflammatory and immunosuppressive actions[1]. So, care should be exercised in the rational selection of steroids[2.] Hence this study was carried out to asses the prescribing pattern of steroid usage. This was a prospective, observational and an intervention study.The patient data was collected in well design data collection form and subjected to descriptive statistical analysis 165 cases assessments shows, the mean age of inpatient & out patient was 56.58/55.10 years and male patients were more in both the groups. The occupational results showed Farmers and businessman's were more followed by House wife. 52.9% IP - 54.1% OP were alcoholics, 58.7% IP - 73.8% OP were smokers. Steroids were used more in respiratory diseases like COPD [18.2% IP /85.2% OP] , Acute bronchitis [24.0% inpatients] and Bronchial Asthma [11.5% IP/ 9.9%OP]. Among steroids, Budesonide [64.4%IP/ 85.2%OP] was frequently used followed by Prednisolone [(5.7%IP/ 14.8%OP], and Dexamethasone 6(5.7%) and Hydrocortisone 25 (24.2%) in IP. 50.0% Nebulization forms were used widely, followed by Injection(29.8%), 85.2% OP was used Inhalers, 55.8% IP& 14.8% (OP) prescriptions had steroidal drug interactions. 81.8% inpatients were counseled correct use of steroids. The mean hospital stay of inpatients was 6.11 with SD of 4.86 days. This study showed that the prescribing of steroids was rational &. Patient counseling services were helped them to understand their therapy, disease. Even though the drug interactions observed with the steroids, benefits of therapy were noticed more.

Keywords: Prescription pattern, Drug interactions (DI), Rational drug usage (RDU), IP; Inpatient, OP; Out patients

INTRODUCTION

Prescription orders are an important transaction among the physician and the patient, which also focus the diagnostic acumen and therapeutic proficiency of the physician in palliation or the restoration of the patient's health. Prescribing of the drugs is an important skill, which needs to be continuously assessed and refined accordingly. Generally medical audits (monitoring, evaluation and necessary modifications in the prescribing practice) oversee the observance of standards of medical treatment (rationale and cost effective) at all levels of the health care delivery system. Steroids are prescribed widely by the medical practitioners, for improving the certain clinical conditions and also for a subjective sense of well-being attributable to powerful anti inflammatory and immunosuppressive actions.[1]. So, essential care should be considered in the rational use of steroidal drugs.

Rational drug use is defined as, getting the right drug to the right patient at the right time in the right dose at the right price.[9]

The patterns of drug use in a hospital set up monitoring, analyzing continuously/intermittently will help in promotion of rationality and also offer feedback and/or suggestions/suitable modifications in prescribing patterns for increasing the therapeutic benefits by reducing the adverse effects.

The irrational use of drugs (e.g. inadequate dose or polypharmacy) may lead to failure of therapy or drug interactions/adverse reactions and increase the cost of therapy /mortality.[3-11] One of the reason for the major causes of irrationality, in an Indian hospital is lack of clinical pharmacist involvement & encourage, in the clinical practice prescription monitoring . The clinical pharmacist has a major role in promoting the steroids utilization rationally, by educating and promoting the evidence-based practice guidelines.(e.g.: Compare to high and low dose steroids, low-dose steroid usage decreases the several patients experiencing hyperglycemia, secondary infection, and has no significant difference in outcomes at two weeks and lack of safety information about long-term, high-dose inhaled corticosteroids[14]).

This kind of study was not conducted in a rural hospital; hence the present study is carried out to know the usage and prescribing patterns of steroids. The data generated from this study shall be helpful to communicate with the prescribers and suggest the various lacunae observed for improving the prescribing practices for achieving better patient outcomes and data will also be helpful in planning longitudinal studies on prescribing patterns and drug utilization patterns. Thus it ultimately benefits the patients in minimizing the incidences of steroids adverse effects if any and in the cost therapy reduction.

MATERIALS & METHOD:

Study Design

The present study was prospective, observational and an intervention study conducted for a period of 6 months in the various units of Medicine department of Adichunchanagiri Hospital and research center, B.G.Nagara, after obtaining the ethical clearance.

Study criteria; Inclusion criteria:

- Either sex of 18-80 years of both in-patient and out- patients.
- Patients taking steroids containing prescription of any disease.

Exclusion Criteria:

- Patients who are not willing to give the consent to participate.
- Pregnant and lactating patients & Mentally retarded patient

Source of data:

Inpatients: Patient case records, medication charts and lab reports and patient interview/ patient care taker interview.

Outpatients: Prescriptions

Material used:

Data collection form, patient consent form, Dummy inhalers

Study procedure:

Treatment charts of inpatients and prescriptions of outpatients were screened for Steroids, The patient, their caretaker/relatives was informed about the study and their consent was taken. The Steroidal prescriptions/treatment chart details were collected and entered in the well designed patient data collection form by obtaining the relevant information patient/patient care takers. Prescriptions of outpatients and treatment charts of Inpatients were reviewed prospectively. The collected prescriptions were analyzed, the pattern of steroids uses like their category, indication, rationality of the prescription (number of Steroids prescribed, appropriateness of dose, dosage form and duration of therapy) and number of drugs in the prescriptions. Out patient Prescriptions and inpatient treatment charts were reviewed for the drug-drug interactions by using MICROMEDEX software and relevant books available in the department.[10-13] ADRs found in inpatients were recorded and reported. Patient counseling services were also provided to the patient, which was concentrated mainly on description of disease, risk factors for the same, efficient use of inhalers, possible ADRs and the methods to prevent or to minimize (e.g. patients were advised to rinse the mouth properly with fresh water after each use of inhaled steroid

preparation). The data were assessed by Descriptive statistical analysis like Mean $\pm$ SD (Min-max) are calculated along with the significance of the same (P value).

RESULTS AND DISCUSSION:

About 180 patients approached, but only 162 patients are agreed by giving their consent**.** The inpatients(IP) age distribution showed , <20 years was (0.9%), 21-30 years (7.7%), 31-40 years (8.6%), 41-50 (16.3%), 51-60 years (24.1%), 61-70 years (28.8%), >70years (13.4%) and in an outpatient(OP) 41-50 years (39.3%), 51-60 years (42.6%), 61-70 years , >70 years (4.9%) respectively. The mean age of Inpatients / outpatients was 56.58 $\pm$15.15 and 55.10 $\pm$ 7.09 years. This data reveals that maximum use / prescribed steroids were observed above 50 years of age. Age distribution was statistically similar in both with a P value = 0.475. Gender distribution showed among 104 inpatients 71.1% was male and 28.9% were females. Among out-patients, 77.1% were male, 22.9% were female. This data showed that commonly the male population is more prone to diseases, for which Steroids were used.(Figure 1).
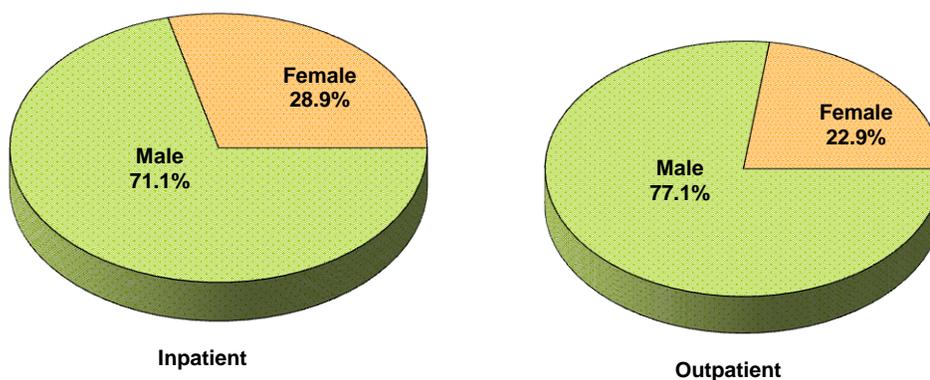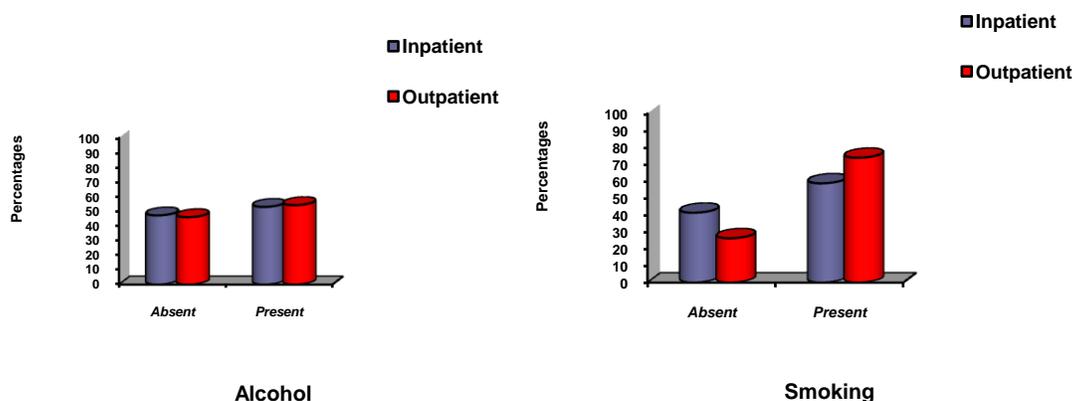

Figure 1: Details on distribution of inpatient and out patients

Occupation details of patients showed, out of 104 Inpatients, 36.5% were farmers, 24.1% patients were business, 20.2% patients were housewives, 4.8% were employed, 5.7% patients were retired personnel, 5.8% Daily workers/coolie, 1.9% were students, and others were 1.0%. Out of 61 outpatients, 21.3% were business, 19.7% were housewives & farmers , 14.7% were retired, 11.4% were employed , 9.8% were daily worker/coolie, 3.2% patients were students, . This indicates that more patients were farmers/business/housewife's followed by others were suffering with the ailments for which steroids are prescribed/used. The reason behind this may be the exposure to causative/precipitating agents like dust / allergens like pollens with farmers and their social habits like smoking which may contribute in exacerbation/precipitation of ailments like COPD and Asthma. (**Table 1**)

Table 1: Details on distribution of patients Occupation

Occupation	Inpatient		Outpatient	
	N	%	N	%
Farmer	38	36.5	12	19.7
Business	25	24.1	13	21.3
House wife	21	20.2	12	19.7
Employee	5	4.8	7	11.4
Retired	6	5.7	9	14.7
Daily worker/Coolie	6	5.8	6	9.8
Student	2	1.9	2	3.2
Others	1	1.0	-	-
Total	104	100.0	61	100.0

The alcohol and smoking habits of the IP/OP showed, 52.9%/ (54.1%) were alcoholics and 58.7% / 73.8% were smokers. Distribution of Alcohol is statistically similar in two groups i.e.P = 0.505 & Incidence of Smoking is significantly more in Outpatients with P = 0.036. These social habits may precipitate or worsen in some of the diseased condition makes them to use steroidal drugs which are having a long term risk. (Figure 2)

Figure 2: Detail on Distribution of patient's habits

The use of steroids in various diseases of Inpatients showed, in COPD(18.2%), acute/allergic bronchitis and exacerbation(25.9%), Bronchial asthma(12.5%), in for Snake bite (8.6%), for Chronic bronchitis (6.75%), for Essential Hypertension with other Co-morbidities(2.8%), for Hypoglycemia with COPD (1.9%), & miscellaneous diseases(23.35%). Among Out-Patients, COPD patients (85.2%), were used more with steroids followed by Bronchial asthma (14.8%). A similar study by Ankit P, Bharat G reported that Glucocorticoid drugs were maximally utilized in disease related to the respiratory system[2]. In our study we found that the steroids were used for a variety of diseases, disorders and conditions among which COPD [18.2% IP and 85.2% OP] was the most prevailing ailments followed by Acute bronchitis exacerbation [24.0% IP] and Bronchial Asthma [11.5% IP & 9.9% OP].This shows that steroids were mostly used for

respiratory diseases. Apart from this, the study also showed that for other ailments for which the steroids were used are; in partial Hanging(for reduce inflammation) and hypoxic encephalopathy. Steroids were also used in the treatment of OP Compound poisoning, Pneumonia, Utricaria, Dilated Cardiomyopathy, Polyarthralgia, Chronic bronchitis, Asthma, Essential hypertension and Meningitis. (Table 2).

Table 2: **Detail on distribution of patient's disease**

Diagnosis	Inpatient		Outpatient	
	N	%	N	%
1.COPD	19	18.2	52	85.2
2.Acute bronchitis & exacerbation	25	24.0	-	-
3.Bronchial Asthma	12	11.5	6	9.9
4.Allergic Bronchitis	2	1.9	-	-
5.Snake bite	9	8.6	-	-
6.Asthma	1	1.0	3	4.9
7.Chronic bronchitis	7	6.7	-	-
8.Essential HTN	3	2.8	-	-
9.Hypoglycemia with COPD	2	1.9	-	-
10.Type-2 DM, Essential HTN	3	2.8	-	-
11.Partial hanging	1	1.0	-	-
12.Pneumonia	1	1.0	-	-
13.Meningitis,Acute gastritis	1	1.0	-	-
14.OP Compound poisoning	2	1.9	-	-
15.Polyarthralgia for evaluation	1	1.0	-	-
16.HIV	1	1.0	-	-
17.Hanging	3	2.8	-	-
18.Dilated cardiomyopathy	1	1.0	-	-
19.Utricaria	1	1.0	-	-
20.Others	9	8.6	-	-
Total	104	100.0	61	100.0

Among the 4 categories of steroidal drug usage in IP, most widely used was Budesonide (64.4%) followed by, Hydrocortisone (24.2%), Prednisolone (5.7%), Dexamethasone (5.7%). Amongst OP Budesonide (85.2%) was most widely used followed by Prednisolone (14.8%). Among various Dosage forms of steroids use in IP, Nebulization was most widely/frequently used (50.0%) followed by Injection 29.8%, Injection and Nebulization were in 15.3%, Tablets and Nebulization were at 4.8% patients. In OP, Inhaler was most widely used (85.2%) followed by Tablet and Inhaler in 14.8% patients. it was due to ease of administration and severity of the patient condition, as hydrocortisone can't be administered orally or through inhalation so its use is limited to in-patient, the same is the case with dexamethasone, but prednisolone is the preferred agent because of its good oral bioavailability thereby making it a preferred agent as a maintenance therapy in Asthma as most of steroid prescribing was for respiratory diseases so

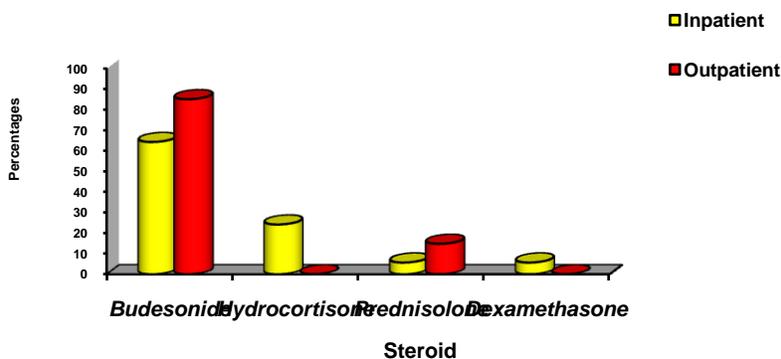inhalation products were prescribed in the majority according to guidelines. (Figure 3 & 4) .

Figure 3: Details on distributions of type of Steroid usage
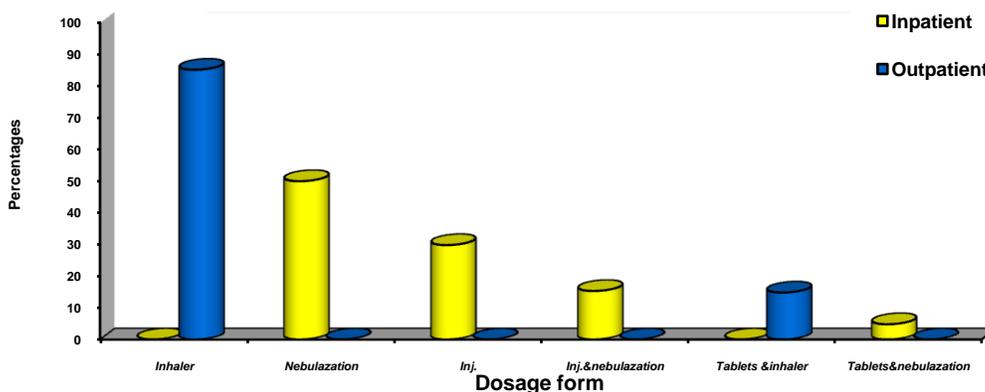

Figure 4: Details on distribution of types of steroidal Dosage forms used

The Incidence of drug interaction observed in (55.8%) IP prescriptions having some or the, other drug interactions (mild to moderate). In OP only 14.8% patients prescriptions having drug interactions. Although these drug interactions present in some prescriptions, but all were found to be minor and insignificant. We found that Incidence of drug interaction is statistically significant & more associated with Inpatient with P <0.001. (Figure 5).
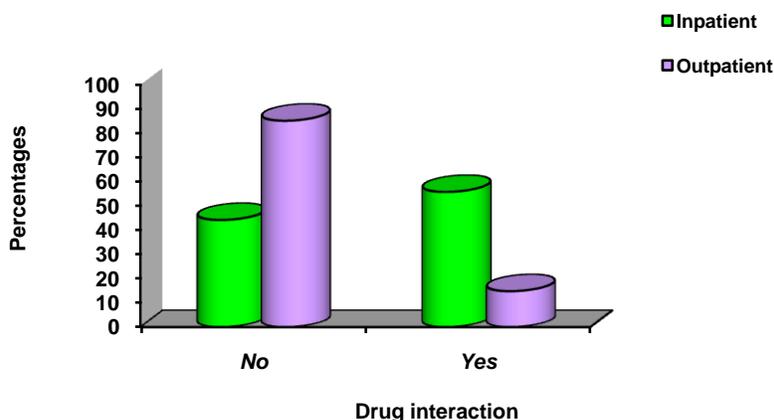

Figure 5: Detail on distribution of Incidence of drug interactions

Patient counseling services about the use and necessasory information provided in IP were (81.8%), . In out-patients all patients were counseled about the use of steroids. The significance of patient counseling was found high with P value <0.001. The mean hospital stay of IP was 6.11 days with a standard deviation (SD) of 4.86 days (Figure 6). Number of days in the hospital is one of the markers of the effectiveness of the prescription although there are other factors which are responsible/consider for total number of days stayed in hospital.
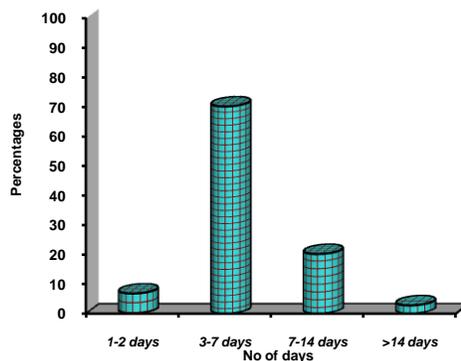

Figure 6: Details on distributions of patient stay in hospital

CONCLUSION

The present study concluded that the prescribing & use of steroids was found rational. The drug interaction even though the observed benefit outweighs the risks was more. Patient counseling services for both patients helped to understand their therapy, disease and safe use of steroidal drugs. Interestingly there were no Adverse Drug Reactions with steroids was observed during the study period. This study suggests that the prescribing pattern of steroids in this tertiary care rural teaching hospital is appropriate and according to the guidelines. But the involvement of clinical pharmacist in clinical practice helps them to increase the proper usage of medication and better outcome.

Limitations

- The study was conducted for a short period (6 months) which can be extended.
- The study was conducted in medicine departments which can be extended to other departments like dermatology, ENT, ophthalmology etc.

Future Directions

- Creating awareness regarding the safe and effective use of steroidal drugs (i.e. Inhaler steroids) by proper education.
- This type of study should be conducted timely to ensure the proper and efficient use of drugs.

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