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A STUDY ON RECENT TRENDS OF PRESCRIBING PATTERN IN ORTHOPAEDIC OUT-PATIENT DEPARTMENT FROM A TERTIARY CARE TEACHING HOSPITAL

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Abstract:

Objectives:

The present study was undertaken to determine the recent trend in pattern of drug prescribing in an orthopaedic outpatient department (OPD).

Methods:

This prospective observational study was planned and conducted in the OPD of the department of orthopaedics for five months. Prescriptions were collected from patients attending the orthopaedic OPD and analyzed using World Health Organization (WHO) drug indicators.

Results:

A total of 1020 prescriptions were collected and studied, in which 46.07% were from males and 53.92% from females. Among the total of 2680 drugs prescribed, 2224 (83%) were oral formulations. Average number of drugs per prescription was 2.62 with a range between 1 and 6. About 9.06% drugs were prescribed by generic name. Utilization from the national list of essential medicines India was 67.20%. The percentage of encounters in which an antibiotic or injection was prescribed was 7.75% and 8%, respectively. Prescriptions which contained fixed dose combinations were 71.47%. The most routinely prescribed drugs among the various classes were non steroidal anti-inflammatory drugs (NSAIDs) 47.91%, gastro protective agents 30.22%, pregabalin 4.67%, calcium 4.36% and vitamin D 2.35%.

Conclusion:

Though prescribing was found to be largely rational, prescribers need to be encouraged to prescribe only by generic names and drugs from essential drug list (EDL). The conventional non selective NSAIDs are generally co prescribed

with gastro protective drugs. Use of selective COX-2 inhibitors (Coxibs) was almost zero, anticipating cardiovascular adverse events. Prescribing pattern of Pregabalin and vitamin D has been increased.

Key word:

NSAIDs, Prescribing pattern, Pregabalin, WHO core drug use indicator.

Introduction:

Drug prescription pattern has been changing according to availability of newer drugs and various distantly among different geographical areas influenced by patient's characteristic, socioeconomic status, environmental influences and types of disease prevalence. Prescription instructions given by the doctor to the patient may be taken as a reflection of physician's attitude towards the disease and the role of drug in its treatment. Irrational prescription of a drug is a global problem. Bad prescribing habits lead to ineffective and unsafe treatment, exacerbation or prolongation of illness, distress and harm to the patient, and higher cost ¹.

To create awareness about irrational use of drugs, it is mandatory to audit the prescription frequently and provide feedback to the prescriber to suggest modification in prescribing pattern to make medical care rational and cost-effective ². Rational use of drugs is based on use of right drug, right dosage at right cost which is well reflected in the world health organization (WHO) definition: "Rational use of drugs requires that patients receive medications appropriate to their clinical needs, in doses that meet their own individual requirements for an adequate period of time, at the lowest cost to them and their community"³. To improve the overall drug use, especially in developing countries, international agencies like World Health Organization (WHO) and International Network for Rational Use of Drugs (INRUD) have recommended standard drug use indicators ^[4, 5].

Drug utilization studies are continuing programmes that review, analyze and interpret the pattern of drug use against pre-determined standards. This drug utilization study was conducted to study the recent trend of drug prescribing in an orthopaedic outpatient department.

Materials and Methods:

It was a hospital based prospective observational study, planned and conducted over a period of 5 months from July 2014 to November 2014 in the department of orthopaedics outpatient department at Pondicherry Institute of Medical Sciences, Pondicherry. Prescriptions were daily collected from the patients of both sex and all ages who attended the orthopaedic outpatient department. Institutional ethical committee approval was obtained prior to the study procedure.

Prescriptions were analyzed under the following headings:

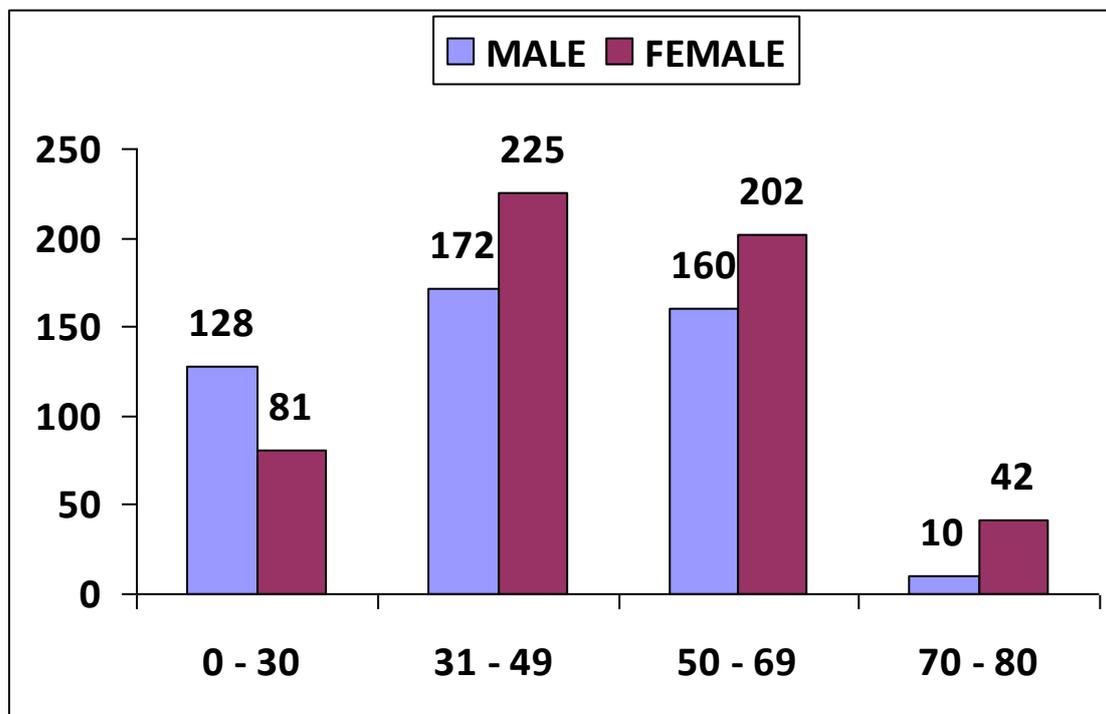
- ❖ WHO prescribing indicators such as¹: (1) average number of the drugs per prescription, (2) percentage of the drugs prescribed by generic name, (3) percentage of encounters in which an antibiotic was prescribed, (4) percentage of encounters with an injection was prescribed, (5) percentage of the drugs prescribed from an essential drug list
- ❖ Various classes of drugs prescribed
- ❖ Fixed dose combination (FDC)
- ❖ Most commonly prescribed Non Steroidal Anti-inflammatory Drugs (NSAIDs) and gastro protective agents.

Statistical methods: Data were entered and analyzed using Microsoft Excel 2007.

Results:

In a five months period of study, a total of 1020 prescriptions were collected and analyzed. Among the 1020 prescriptions, a total of 2680 drugs were prescribed, in which 46.07% were males and 53.92% were females. Age and gender wise distribution of demographic profiles have been described in Figure 1. Majority of the orthopaedic patients were observed in the age group of 31 to 49 years with female predominant.

Figure 1: Age & gender wise distribution of orthopaedic cases:



WHO prescribing indicator analysis shows that among the total drugs prescribed, 2224 (83%) were oral formulations and 410 were topical applications. Average number of drugs per prescription was 2.62 with a range between 1 and 6. About 243(9.06%) drugs were prescribed by generic name. Utilization from the national list of essential medicine

India was 1801(67.20%). The percentage of encounters in which an antibiotic was prescribed in 79 patient encounters (7.75%) and an injection was prescribed in 81 patients encounters (8%), which was shown in Table 1.

Table-1: Drug usage pattern in orthopaedic patients.

Prescribing Indicators assessed	Results
Total number of prescriptions analyzed	1020
Total number of drugs prescribed	2680
Average number of drugs per prescription	2.62 (1-6 drugs)
Percentage of drugs prescribed by generic name	243/2680 (9.06%)
Percentage of drugs prescribed from essential drug list	1801/2680 (67.20%)
Percentage of encounters in which antibiotic prescribed	79/ 1020 (7.75%)
Percentage of encounters in which injection prescribed	81/ 1020 (8%)
Percentage of prescription contain Fixed dose combination	729/ 1020 (71.47%)

Table 2: shows the overall drugs prescribed were, Nonsteroidal anti-inflammatory drugs 1284 (47.91%) followed by antiulcer drugs 810 (30.22%), opioid analgesic 106 (3.95%), anti-inflammatory enzymes 57 (2.12%), calcium 117 (4.36%), Vitamin D granules 63(2.35%), Pregabalin 125 (4.67%), antibiotics 79 (2.94%), methylcobalamin 77 (2.87%) and multivitamin mineral drugs of 92 (3.43%).

Table-2: Various drugs prescribed in orthopaedic OPD.

Name of the drug	Frequency of prescription	Percentage (%)
NSAIDs	1284	47.91%
Anti ulcer drugs	810	30.22%
Pregabalin	125	4.67%
Calcium	117	4.36%
Opioid analgesic	106	3.95%

Multivitamin mineral	92	3.43%
Antibiotics	79	2.94%
Methylcobalamin	77	2.87%
Vitamin D granules	63	2.25%
Anti-inflammatory enzymes	57	2.12%

% calculated from a total of 2680 drugs.

A total of 729 (71.47%) of fixed dose combinations were used, which was shown in Table 3. The commonly prescribed drugs were aceclofenac plus paracetamol prescribed to 485 patients, diclofenac plus paracetamol plus chlorzoxazone prescribed to 102 patients, chymotrypsin plus trypsin prescribed to 57 patients, aceclofenac plus paracetamol plus chlorzoxazone were prescribed to 23 patients, followed by ibuprofen plus paracetamol to 20 patients and aceclofenac plus serratiopeptidase were prescribed to 16 patients.

Table-3: Fixed dose combination used in orthopaedic patients.

Combinations used	Frequency of prescription (%)
Aceclofenac + Paracetamol	485 (47.54%)
Diclofenac+ Paracetamol + Chlorzoxazone	102 (10%)
Aceclofenac+Paracetamol+ Chlorzoxazone	23 (2.25%)
Ibuprofen + Paracetamol	20 (1.96%)
Aceclofenac + Serratiopeptidase	16 (1.56%)
Trypsin + Chymotrypsin	57 (5.58%)
Amoxicillin + Clavulanate	14 (1.37%)
Ibandronate + Calcium	12 (1.17%)

% Consumptions out of 1020 prescription

Most commonly prescribed NSAIDs were aceclofenac with fixed dose combination and diclofenac with fixed dose combination followed by indomethacin prescribed to 73 patients, paracetamol to 67 patients and nimesulide to 24 patients. The gastro protective agents prescribed were H2antagonist ranitidine (51.47%) and proton pump inhibitors (PPIs) (27.94%) were omeprazole, pantoprazole and rabeprazole, which was shown in Table 4 and5.

Table-4: Commonly prescribed NSAIDs.

Name of the drugs	Frequency of prescription (%)
Aceclofenac with FDC	524 (51.37%)
Diclofenac with FDC	102 (10%)
Indomethacin	73 (7.15%)
Paracetamol	67 (6.56%)
Diclofenac	52 (4.90%)
Nimesulide	24 (2.35%)
Ibuprofen with FDC	20 (1.96%)
Lornoxicam	08 (0.78)
Piroxicam	02 (0.19)
Parenteral Diclofenac	37 (3.62%)
Topical NSAIDs	375 (36.76%)

% Consumptions out of 1020 prescription

Table-5: Commonly prescribed anti ulcer drugs.

Name of the drug	Frequency of prescription (%)
Ranitidine	525 (51.47%)
Omeprazole	122 (11.96%)
Pantoprazole	92 (9.01%)
Rabeprazole	71 (6.96%)

% Consumptions out of 1020 prescription

The antibiotic prescribed were 7.75%, among it cefixime 21 (2.05%) was frequently prescribed followed by ciprofloxacin 15 (1.47%), amoxicillin plus clavulanate was 14 (1.37%) and clindamycin 7 (0.68%). Parenteral methylprednisolone was prescribed to 3.72% and bisphosphonates like alendronate (0.39%) and Ibandronate (1.47%) were also prescribed, which was shown in Table 6 & 7.

Table-6: Frequently prescribed antimicrobial agents.

Dosage form	Drug	Frequency of prescription
Oral	Cefixime	21 (2.05%)
	Ciprofloxacin	15 (1.47%)
	Amoxicillin + Clavulanate	14 (1.37%)
	Clindamycin	07 (0.68%)
	Amoxicillin	03 (0.29%)
Parenteral	Amikacin	05 (0.49%)
Topical	Neomycin/Polymyxin	14 (1.37%)
	Povidone Iodine	04 (0.39%)

% Consumptions out of 1020 prescription

Table-7: Other drugs prescribed in orthopaedic OPD.

Dosage form	Drug	Frequency of prescription
Parenteral	Methylprednisolone	38 (3.72%)
Oral	Alendronate	04 (0.39%)
	Ibandronate	15 (1.47%)

% Consumptions out of 1020 prescription

Discussion:

In our present study more female patients (53.92%) visited the orthopaedic outpatient department and most of them were in the age group of 31 to 49years (41%) followed by (36.73%) in the age group of 50 to 69. With regard to the average number of drugs per prescription, the value in our study was 2.62, this finding is not acceptable compared with the standard (1.6 – 1.8) derived value from WHO ⁶. However, this finding is similar to other studies conducted in India, the values ranging from 2.47 to 3.23 ^[7, 8] which was justified in this study. It is preferable to keep the number of drugs per prescription as low as possible since poly pharmacy leads to increased risk of drug interactions, increased hospital cost and errors of prescribing ⁹.

The percentage of drugs prescribed by generic name was just 9.06%, which is very much less than the standard value of (100%) ⁶, which indicates brand names are more popular among practitioners and they are directly influenced by various drug company representatives for undue favours. Similar hospital based study carried out by Sheikh Ubedulla

Kanagasanthosh. K* et al. *International Journal Of Pharmacy & Technology* et al from Khammam⁷ and Balbir et al from Haryana¹⁰, reported to only 4.25% and 4.16% respectively, which is low compared to the standard and to our findings. A generic drug (generic drugs, short: generics) is a drug defined as "a drug product that is comparable to brand/reference listed drug product in dosage form, strength, route of administration, quality and performance characteristics, and intended use."¹¹. Thus, we must educate and encourage our medical practitioners to adhere strictly to generic name for prescription. Prescribing by generic name also facilitate cheaper treatment for the patients.

In our study the percentage of encounters in which an antibiotic was prescribed to be 7.75%, which is acceptable and less than the standard value (20.0% - 26.8%), derived to be ideal⁶. Study conducted by Prerna Upadhyaya et al from Jaipur showed the higher percentage of antibiotic prescription (63.33%)¹². This results revealed the importance of the judicious use of antibiotic to prevent emergence of resistance and ideal to use after culture and sensitivity. The percentage of encounters in which an injection was prescribed in our study was 8%, which is acceptable and less than the standard value (13.4% - 24.1%) derived to serve as ideal⁶. Minimum use of injections is preferred and this reduces the risk of infection through parenteral route and cost incurred in therapy¹³.

In this study the percentage of drugs prescribed from the national essential drug list was 67.20%, though it was comparable with other Indian studies^[10, 13] but was still on lower side when compare to standard (100%)⁶. Hence we should encourage our medical practitioners to understand the importance of prescribing from essential drug list. About 71.47% prescriptions contained fixed dose combinations, which is comparatively less than other similar studies¹⁰. The routine use of FDCs is irrational, inappropriate use of unwanted drugs in the combination may lead to adverse effect or drug interactions. Judicial use of FDCs should be avoided unless necessary.

In the orthopaedic prescription, the most commonly prescribed drugs were NSAIDs followed by antiulcer drugs. These findings were similar to other studies conducted in orthopaedic OPD^[7, 14]. Among the NSAIDs both the classes of selective and non selective NSAIDs were prescribed in our present study, yet none of the prescription contains any selective COX-2 inhibitors as a therapeutic drug. Assuming better safety profile for COX-2 selective inhibitors than non selective NSAIDs, the COX-2 inhibitors were developed and became very popular few years back. The withdrawal of rofecoxib and valdecoxib by the manufacturing company for causing cardiovascular side effects has probably changed the prescribing pattern of NSAIDs¹⁵. However, the results of present study points towards the reversal of trend back to the use of selective or non selective NSAIDs than selective COX-2 inhibitor.

Even though novel generic drugs of selective COX-2 inhibitors have been available, anticipating the severe adverse effect caused by other Coxibs, their use has been reduced in clinical practice.

Almost 79.41% prescriptions were co-prescribed with NSAIDs and gastro protective agents. The most common gastro protective agent was ranitidine (51.47%), followed by proton pump inhibitor (27.94%). Even though PPIs produce more sustained acid suppression and promote ulcer healing as compared to ranitidine, the cause for increased ranitidine use may be due to cost effective factor.

Pregabalin a novel antiepileptic drug which also used in neuropathic pain has been playing a therapeutic role in orthopaedic department^{16, 18}. In our study the pregabalin prescription was almost 4.67%, which was the 3rd most commonly prescribed drug following NSAIDs and antiulcer drugs. The reason for increased frequency of prescription could be an adjuvant pain reliever in orthopaedic patients, as most of the patient would be suffering from pain of various etiologies. It can be justified, if we compare with many Pregabalin studies, which shows in the treatment of refractory neck pain under routine medical practice a study by Florez-Garcia et al¹⁷, an another study by Takahashi et al¹⁸ revealed the combination of NSAIDs with Pregabalin results in lower incidence of spinal surgery for treatment of leg symptoms within first year of therapy. So, this finding may be an eye opener for medical practitioner to prescribe pregabalin for all sort of pain reliever but, still it requires many studies to confirm the findings.

In our study 2.35% of prescriptions contain Vitamin D granules. The role of Vitamin D in therapeutic prescription has been increasing in recent era, which is supported by 3 studies being done by Patton M et al¹⁹, Maier GS et al²⁰, and Nathan Gray²¹. With this back ground information, the importance of prescribing Vitamin D has been emerged as add on drug in orthopaedic department, yet many prospective observational study required to confirm the findings.

Conclusion:

Our study reveals much new information to the medical practitioners in the prescribing practice. Percentage of encounter with an antibiotic and an injection were found to be adhering to the standard recommended by WHO. On the other hand, poly pharmacy, generic prescribing and prescribing from national essential drug list were found to be a problem in this study and shows deviation from standard WHO recommendation. Though prescribing was found to be largely rational, prescribers need to be encouraged to prescribe only by generic names and drugs from EDL. Anticipating severe adverse effect caused by Coxibs, the results of present study points towards the reversal of trend back to the use of selective or non selective NSAIDs than selective COX-2 inhibitor. NSAIDs were commonly co-

prescribed with gastro protective agents, in which ranitidine was the most common gastro protective preferred with NSAIDs. On the other hand prescribing practice of Pregabalin found to be increased in this study.

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