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Original Research Article

Prescription pattern and rationality of drugs study of patients of OPD (outpatient) of orthopedics Department of RKDF Medical College Hospital and Research Centre, Bhopal, MP, India

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ABSTRACT

Background: To study the prescription pattern of drugs prescribed to patients of OPD of orthopedics department and to analyze the rationality of drugs prescribed by doctors of RKDF MCHRC, Bhopal, MP, India.

Methods: A prospective, observational study was planned for 200 patients selected in the year 2015. Collected data were entered in a predesigned forms downloaded from WHO website. Rationality of drugs prescription was analyzed using WHO drug utilization and prescription indicators. For generic drugs reference NLEM 2011 and for cost analysis, Drug Today 2014 was used.

Results: out of 200 patients, 41% were male and 59% were female. Average numbers of drugs prescribed per prescription was 3.3. Most commonly prescribed drug was Analgesics an Anti-inflammatory (37.1%) in oral as well as Intramuscular injections and Topical forms, Gastric acid inhibitors (15.4%), Muscle relaxants (12.1%) Calcium and Vitamin D, glucosamines (12.1%), Antimicrobials (8%), Steroids (1.8%), Enzyms serratiopeptidase (1.8%). Most commonly prescribed Analegsic was FDC of Trypsin+ Rutoside+ Bromelin+ Diclofenac (30.6%) followed by FDC Acceclofenac+ Paracetamol+ Seratiopeptidase (15.9%), followed by FDC Tramaodol+ Paracetamol (11%). Drugs prescribed in generic form were 0%. Average cost of treatment was INR 600 per prescription. Most common route of drug prescription was 1. Oral route 81.7%. 2. Topical 6.4%. 3. Injectable intramuscular 6.2% and intra articular 5.7%. Duration of treatment was prescribed in 81%. Frequency of drug administration was mentioned in 100% of prescriptions. EDL prescription was

81%. FDCs were 35%. **Conclusions:** There was Poly pharmacy. Drugs prescribed in generic form were very low. Drugs prescribed from NLEM were 81%. CMEs on Rational drug therapy to doctors working in orthopedics department should be conducted to promote rational use.

Keywords: Essential drug list, Generic, Indian drug review, Rational, WHO prescription indicators

INTRODUCTION

According to WHO "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".

Drug utilization and prescription pattern studies done in variety of hospitals denote the prescription trends prevailing in that hospitals which is influenced by many factors including the knowledge and experience of the prescribing doctor. These types of studies help us know the prevailing trends of drugs being used, in addition we can study the rationality of drugs being used Prescription audit helps in Rational use of medicines (RUM).^{2,3}

This type of prescription pattern study was never carried in this hospital, so it was planned to conduct prescription pattern study of drugs as per WHO drug prescription indicators, and to find rationality of drugs use in this set up after obtaining clearance from institutional ethics and research committee.

METHODS

After applying inclusion and exclusion criteria, 200 OPD patients were selected for this prospective observational study in the year 2015.Demographic data was then entered in pre decided forms.

Inclusion criteria

Patients coming to OPD of orthopaedics department mainly.

Exclusion criteria

Those OPD patients who were later admitted in wards of orthopaedics department/other referred patients to orthopaedics department by other departments.

In a predesigned form, demographic data, OPD number, age, sex, generic or branded drugs, dose, duration and route of drug administration, whether from essential drug list or not, diagnosis, coexisting conditions /diseases, their treatment ere noted.

Generic name and cost of the drugs was evaluated using drug today.

Statistical analysis

Statistical analysis was done for descriptive analysis was done by SPSS version 2.0.

RESULTS

1. Demographic distribution of 200 patients of OPD, Orthopedics, RKDF MCHRC.

Sex

- Male -82 (41%)
- Female-118 (59%)

Age

- Below 15 = (10%)
- Between 15-30= (10%)
- Between 30-45= (25%)
- Between 45-60= (30%)
- Above 60= (25%)

Table 1: Causes of visit to orthopaedics OPD.

S. No	Condition	Diseases	% of OPD visits	
	Cold orthopaedics N=161=80%	Various Arthritis	28	
		Numbar radicular pain	24	
1		cervical pain	16	
		planter fasciitis	8.1	
		multiple joints	2.4	
		Misc Tenis Elbow	1.6	
	Fracture complications N=30=15%	Fracture Wrist	4.5	
		Fracture Femur I/T	3.7	
		Forearm	2.2	
2		Fracture Femur Neck	2.2	
		Fracture shoulder	1.5	
		Fracture Misc	0.7	
3	Misc, AVN, CTEV N=10=5%	AVN/CTEV/MISC	5	

Causes of visit to OPD

- 1. Cold orthopedics- (80%)
- Inclusive of various arthritis 28%= (osteoarthritis knee 22.4%, Rhematoid Arthritis 4.2%, Gen Arthritis 1.4%).
- Lumbar radicular pain=24%
- Cervical pain=1 6%
- Planter fasciitis= 8.1%
- Multiple joints= 2.4%
- Misc, Tenis elbow etc =1.6%
- 2. Fractures follow up /new-15%
- Wrist= 4.5%
- Intertrochantric femur= 3.7%
- Forearm= 2.2%
- Neck femur= 2.2%
- Around shoulder= 1.5%
- Misc= 0.7%
- 3. Misc-AVN/CTEV/Rare- 5%

Associated diseases

- 1. Hypertension- 20%
- 2. Diabetes- 10%
- 3. Angina/MI-5%

Total number of patients- 200

Total number of drugs prescribed- 660

Average drugs per prescription was 3.03.

Table 2: Overall prescribed drugs.

Sr. No.	Drug given orally, n =539	Number	Total	% Of Oral	% of Total drugs
1	Analgesics alone+ FDC of analgesics+Trypsin, Rutoside, Bromolein, Serratiopeptidase	188		34%	28.4
2	Gastric acid inhibitor, Antacids	102		18.9%	15.4
3	Muscle relaxants,	80		15%	12.1
4	Calcium, Vitamin D, B12, Glucosamines, Trace elements, Nutritional supplements	80		15%	12.1
5	Antimicrobials	53		10%	8.0
5	Steroids	12		2.3%	1.8
6	Enzumes, Serratiopeptidase, etc	13		2.2%	1.8
7	Misc, DMARD/gout drugs	11		2.0%	1.8
	Total		539	100%	81.7%
Topic	Topical= 6.4% n=42				
	Name		Number	% of Topical	
1	Providone Iodine	21		51%	3.2
2	Topical Analgesics/counterirritants- 49 (7.8%) Topical gels containing Diclofenac, Methyl Salicylate, Camphor, Menthol, Methyl Nicotinate, TrolamineSalicylate, Capsaicin,Transdermal Fantanyl patches are used in inflammatory conditions	16		39%	2.5
3	Framycetin sulfate, Silver sulfadiazine	5		10%	0.7
	Total		42	100%	6.4%
Intran	nuscular injections 6.2% n =41				
1	Diclofenac injections intramuscular	41	41	100%	6.2%
Intraa	rticular injections 5.7% n=38				
1	Steroids, Triamcinilone intraarticular	38	38	100%	5.7%
Grand	l Total		660		100%

Total number of patients -200, Total number of drugs prescribed-660

Average drugs per prescription was 3.3, Oral=81.7%

Table 3: Dosage forms of analgesics, anti-inflammatory, enzymes.

Sr. No.	Dosage form n= 245= 100%		No	% of oral analgesic	% of total anal gesics	% of total drugs
1	Oral, Analgesics n=188=76.7%	Trypsin+Rutoside+Bromelin+Diclofenac	75	39.8	30.6	
		Acceclofenac+Paracetamol+Seratiopeptidase	39	20.7	15.9	
		Tramaodol+Paracetamol	27	14.8	11.0	
		Etodolac	21	11.7	8.6	
		Piroxicam	22	12.2	8.5	
		Misc, Indomethacin, Nimesulide, etc	4	2.5	1.6	28.4%
		Oral Total	188	100%	76.6%	
2	Injectables n= 41 =16.7%	Diclofenac	41		16.7%	6.2%
3	Topical Analgesics counterirritants n= 16 =6.5%	Containing Diclofenac+ Methyl sal, Camphor, Menthol, Capsaicin, Trolamine salicylate/Transdermal Fantanyl patches	16		6.5%	2.4%
Total	245		245		100%	37.1%

Oral =188, Injectable=41

Topical =16

Total=245=245/660=37.1% of all drug encounters were with analgesics and anti-inflammatory

Overall Drugs prescribed were route of drug administration

- 1. Oral- 81.7%
- 2. Injectable, Intramuscular- 6.2%
- 3. Topical- 6.4%
- 4. Intraarticular- 5.7%

Drugs given

Oral

- 1. Analgesics Alone and FDC containing Analgesics, Antiinflammatory drugs+ Enzymes-seratiopeptidase, trypsin, chymotrypsin, Rutoside, Bromolein-188 (28.4%).
- 2. Gastric acid inhibitors- 102 (15.4%).

Ranitidine (3.1%), Rabeprazole (6%), Pantoprazole (3.3%), Esmoprazole (1.5%), Omeprazole (1.5%).

3. Muscle relaxants- 80 (12.1%).

Chlorzoxazone (4.8%), Thiocolchicoside (4.2%) Methocarbamol (2.4%), Misc. (0.7%) Tizanidine, Gabapentin, Pregabalin, Espirone.

4. Supplements, Vitamin D+ calcium- 80 (12.1%).

5. Antimicrobials- 53 (8%).

Amoxiclav- (2.1%), Linezolid- (2.4%), Third gen Cephalosporins- (2.5%), (Cefoperazone-1.5%, Cefixime-(1.0%), Ofloxacin- (0.7%), Misc- (0.3%)

- 6. Steroids-12 (2.3%)- Deflazocort.
- 7. Enzymes- Seratiopeptidase, Trypsin, Chymotrypsin, Rutoside, Bromolein- 13(1.8%)
- 8. Topical Analgesics/counterirritants/Antimicrobials-42-(6.4%).

Topical gels containing Diclofenac, Methyl Salicylate, Camphor, Menthol, Methyl Nicotinate, Trolamine Salicylate, Capsaicin, Transdermal Fantanyl patches are used in inflammatory conditions/Povidone iodine/framycetin sulfate/silver sulfadiazine.

- 9. Misc, DMARD- 11 (1.8%)
- 10. Intramuscular Injections-Diclofenac- 41 (6.2%)
- 11. Intraarticular Injections-Triamcinolone- 38 (5.7%)

Most commonly prescribed oral NSAIDS combination was Trypsin+ Rutoside+ Bromelin+ Diclofenac given in 28.4 %.

Table 4: Antimicrobials on OPD basis only oral dosage forms.

Sr. No.	Dosage form	Antimicrobial n=53	Number	% of Antimicrobials	% of total drugs
1	Oral n =53 8% of total drugs 10% of oral drugs given 100% oral	Cefoparazone, Cefixime	12	20.7	1.8%
		Amoxicillin+Clavulonoic	12	22.6	1.8%
		Linezolid	15	28.3	2.3%
		Ofloxacin	6	9.4	0.9
		Misc	8	15.0	1.2
		Total	53	100%	8%

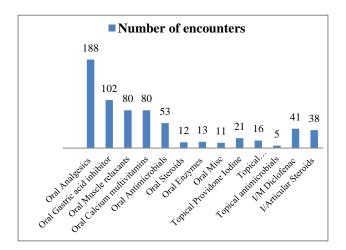


Figure 1: Drug distribution in orthopaedics OPD.

The frequency of drug administration was recorded in 100% of prescriptions. The duration of treatment was mentioned in 81% prescriptions.

WHO drug prescription indicators

- 1. Number of drugs per prescription= 3.3
- 2. Percentage of generic drugs= 0%
- 3. Percentage of encounters with antibiotics= 10%
- 4. Percentage of injections = 11.9%
- 5. Percentage of essential drugs= 81%
- 6. Cost per prescription= Rs. 600/-

DISCUSSION

Polypharamcy is very common. Number of drugs per prescription is 3.3 which is higher than the WHO guideline of 2.02, similar studies in other hospitals in

India mention 5.3% in srividya, Bithi 4.3% while in Ubedulla and Ingle studies it was around 3.⁴⁻⁷ Ideally the number of drugs per prescription should be low so that incidence of drug interactions and adverse effects would also be low but practically Polypharmacy is the usual practice. The intention of orthopaedic surgeons is to ensure better compliance.

Analgesics (37.1%) were the most commonly prescribed drugs in oral, injectable and topical forms, followed by peptic acid inhibitors (18.9%, Muscle Relaxants (15%), multi Vitamin D Calcium, Glucosamine (14.8%), Antimicrobials (10%), Steroids (2.3%), Serratiopeptidase enzyme preparations (2.2%).

Of all analgesics, Trypsin+ Rutoside+ Bromelin+ Diclofenac (NSAID) Oral fixed drug combinations was more commonly prescribed (30.6%) than, Diclofenac. This was in difference with Muraiah and Elsy where Tramodol was used more than Diclofenac. 8,9 In Choudhary DK study shows Diclofenac to be more common. 10

Co prescribed with Analgesics, Proton pump inhibitors (15.4%) were very commonly prescribed while this in in Srividya (17.5%) and Kumars study. 11

Nutritional supplements, multi Vitamins and Calcium (12.1%) were more than with Shankar's study. 12

Topical Analgesics/counterirritants/Antimicrobials-were given to 42 (6.4%) Encounters..

Topical gels containing Diclofenac, Methyl Salicylate, Camphor, Menthol, Methyl Nicotinate, Capsaicin, Trolamine Salicylate, Transdermal Fantanyl patches are used in inflammatory conditions. While Topical Povidone iodine/Silver Sulfadiazine/ Framycetin were prescribed as antimicrobials.

Steroids were given in 2.3% of patients, 80% oral Deflozacart and 20 % injectable Intraarticular (Triamcinolone). We could not find any comparative data in reference studies.

Drugs prescription by generic names is very low in this study (0%) all drugs were prescribed by branded names only similar to Patel study while WHO guideline is to prescribe drugs by generic names is 100 %. ^{13,14} In srividya studies generic prescription was 61%. ³ Other studies also confirm the low percentage of (0-4%) generic drugs prescription of frequent meetings of medical representatives of branded pharmaceutical companies insisting on branded drugs. ^{4,5} While generic drugs are much cheaper to afford by patients, these generics should be more used to curb the cost of the treatment.

Percentage of encounters with antibiotics is 10% in line with WHO guidelines. These medicines add to microbial resistance and extra cost to prescription. These are

prescribed without any culture and sensitivity. Other studies mention low use of antibiotics. 4,5

Percentage of injectable in outpatient department is 11.9%. This is more than WHO guideline of less than 10% injectables. ¹¹ In Afsan's study it was 3%. ¹⁵ Most of the drugs prescribed in OPD practice are through oral route (81.7%). Injections are used more in admitted IPD, ward patients (46%). ³

FDCs, fixed drug combinations in our study was around 35 %, very high in OPD practice .This is more than srivdya studies (18.5%).³ There is a tendency on the part of prescribers to write FDC as it ensures better patient compliance but at the same time chances of adverse drug effects are also more.

Given together steroids, analgesics, antibiotics cause more adverse effects.⁶

A drug prescribed from NLEM was 81%.

Average cost per prescription is Rs. 600 INR. This increases when patients are admitted and require medicines for longer period.

There is a need to conduct such studies on larger number of patients. Prescription audit studies should be periodically conducted to assess the effect of training on rational drug therapy which still has challenges.¹⁶

Strength of the study

Prospective study, better to research.

Limitations

Single centre study, study duration was long, prospective study; everyone involved loses interest monotonous large resources were required.

CONCLUSION

Polypharamcy is very common in OPD. Number of drugs per prescription is 3.3 which are higher than the WHO guideline of 2.02.Drugs prescription by generic names should be promoted. Routine use of antibiotics should be after proper culture and sensitivity testing. Injectable given in OPD should be lower than 10%.Drugs prescribed from essential drug list should be promoted. Topical gels should be preferred over oral ones.

For promoting rational drug therapy, Pharmacology faculties should also visit orthopaedics department to know the various area of improvement.

Regular CMEs on Rational drug prescription should be held by pharmacologists for orthopaedic surgeons in a creative, indirect suggestive way, without hurting anyone's ego and self-respect. Ultimate beneficiary is the patient. In any hospital the best interest is the patient's interest.

This type of study will help surgeons of orthopaedics department/ pharmacologists/ health/ hospital care authorities in policy making.

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Ethical approval: The study was approved by the

Institutional Ethics Committee

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