

Prescription pattern study of drugs in Orthopedics Outpatient department (OPD) of a Rural Medical College Hospital & Research centre in MP

Nagla A¹, Wadagbalkar P^{2,*}, Raipurkar S³, Patel P⁴

¹Assistant Professor, Dept. of Orthopaedics, Index Medical College, Indore, ²Professor, ⁴Assistant Professor, Dept. of Pharmacology, ³Professor, Dept. of Paediatrics, IMCHRC, Indore

***Correspondence Author:**
Email: drprashantw@gmail.com

Abstract

Background: The aim of this study was to study the level of the WHO drug use indicators and drug prescription indicators in the OPD of orthopedics department and find out the rationality of use of various drugs.

Materials & Methods: An observational, prospective, descriptive, study of prescription patterns of 200 patients for six months duration in 2013 was done. Patients demographic details were noted on predesigned forms downloaded from WHO website. Considering WHO indicators of drug utilization & prescription indicators, Generic name and cost of the drugs were evaluated using Indian drug review 2014. NLEM 2011 was used.

Results: Of the 200 patients, 60.2% were male and 39.8% females. About 70.7% patients coming to OPD are senior citizens having Cold orthopedics causes like low back pain, cervical & lumbar radicular pain, Rheumatoid, Gouty arthritis, stiffness of joints, Cervical Spondylitis, Osteoporosis etc. requiring mainly medicines only. Around 29.3% patients were fractures related complications. Analgesics(39.6%), NSAID, Tramadol plus Paracetamol fixed drug combinations, Diclofenac, Aceclofenac, Piroxicam were the most common. Average drugs per prescription were 5.1. Polypharmacy is the rule. Analgesics(39.6%) were used in most of the cases. Second were peptic ulcer prevention drugs(20.2%). Third were anti-microbials(19.6%). Around 98% drugs were branded. NLEM drugs were 84% were from essential drug list. Oral route was common in 99%. Injectables were less than 1%. Topical gels containing Diclofenac, Methyl Salicylate, transdermal Fentanyl are used in inflammatory conditions. Senior citizens 20.2% were already receiving anti-hypertensives and anti-diabetics, anti-gout drugs anti-anginal, Glucosamines, Vitamin D & Calcium(5.7%) etc. Mean cost of drugs per prescription was Rs. 250 INR. Because of chronic nature duration of drugs was mentioned only in 74%. The frequency of drug administration was recorded in 100% cases.

Conclusion: Polypharmacy is the rule, use of generic drugs is also very low, Rational use of drugs must be promoted through regular interaction between pharmacology and orthopedics department. Regular workshops on rational drug use should be organized. There are seasonal variations which need to be further explored in larger population for longer duration.

Keywords: OPD, Rheumatoid arthritis, Gout, Rational, Irrational, NSAIDS. Cold Orthopedics. National model list of essential medicines, NLEM, EDL, DMARDs, Transdermal patches, gels.

Introduction

Low backache & Joint stiffness are an important cause of pain in old age. Arthritis of various types also manifest and trouble patients in old age. Various orthopedics problems of old age are called Cold orthopedics which are mainly treated by drugs only, to be continued for longer duration, Diseases also progress with age, waxing and waning is quite often. More than 40 % of patients coming to OPD of orthopedics are having these cold orthopedics problems.

In General, in orthopedics departments studies are carried mainly on surgical procedures. Very rarely any study of drug distributions type are planned. Because of communication gap between nonclinical pharmacologists and clinical surgical orthopedics consultants who are mostly interested in surgery and have less time also for drug discussions on rational therapy very rarely such studies are conducted.

Drug utilization studies do help in finding a new way to implement the rational drug therapy and areas of improvement in terms of better, effective, economic treatment with lesser adverse effects, lesser suffering to patient (1kaur). So WHO promotes Rational drug therapy(2).

So this study of finding prescribing patterns of drugs in OPD of orthopedics department as conducted with the enthusiastic Dr. Ashok Nagla and medical students with his active support. Institutional ethics committee approval was taken for this study.

Materials & Methods

After applying inclusion & exclusion criteria, 200 OPD patients were selected for this prospective observational study in the year 2013. Demographic data was then entered in pre decided forms.

Inclusion criteria: Patients coming to OPD of orthopedics department mainly.

Exclusion criteria: Those OPD patients who were later admitted in wards of orthopedics department/other referred patients to orthopedics department by other departments.

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

Generic name and cost of the drugs were evaluated using Indian drug review.

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

Results: 1. Demographic distribution

Sex -

Male -122(61%)

Female-78(39%)

Age below 15 =19(9.5%)

Between 15-30=22(11%)

Between 30-60=97(48.5%)

Above 60=62(31%)

Causes of visit to OPD

1-Cold orthopedics-142(70.5%)

Inclusive of

Low backache cervical and radicular pain-87(43.5%)

Various Arthritis & osteoporosis-18(9%)

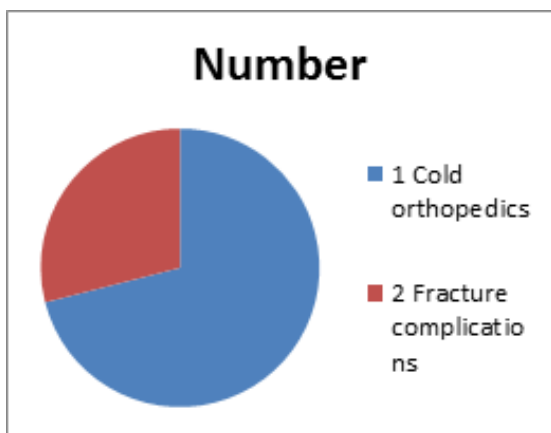
Cervical spondylosis-18(9%)

Misc-19(9.5%)

2-Fractures, complications follow up-58(29%)

Causes of visit to OPD OF Orthopedics

| S. No | Condition | Number | % |
|-------|------------------------|--------|------|
| 1 | Cold orthopedics | 142 | 70.5 |
| 2 | Fracture complications | 58 | 29.5 |



Associated diseases

1. Hypertension -22%

2. Diabetes-11%

3. Angina/MI-4.6%

Total number of patients -200

Total number of drugs prescribed-1058

Average drugs per prescription was 5.3

Overall Drugs prescribed were

Oral

Antimicrobials-207(19.6%)

Analgesics -419(39.6%)

Gastric acid inhibitors-214(20.2%)

Muscle relaxants -81(7.6%)

Enzymes -80(7.5%)

DMARDs, Vitamin D+calcium57 (5.3%)

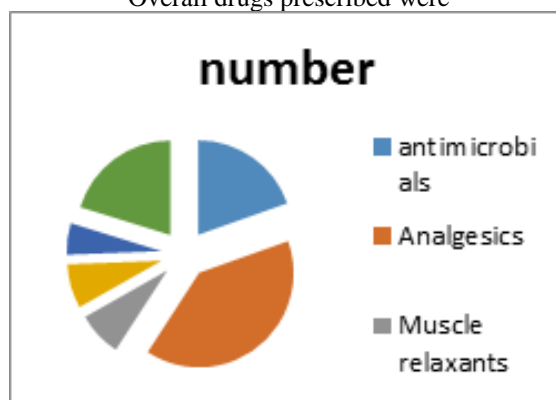
Topical gels: Containing Diclofenac, Methyl Salicylate, Transdermal Fantanyl patches are used in inflammatory conditions.

Most commonly prescribed NSAIDS combination was Tramadol plus paracetamol given in 40%.

Table Overall Drugs prescribed were

| S. No. | Drug | number | % |
|--------|--|--------|------|
| 1 | Antimicrobials | 207 | 19.6 |
| 2 | Analgesics | 419 | 39.6 |
| 3 | Muscle relaxants, | 81 | 7.6 |
| 4 | Enzymes, others, Multivitamin D, Calcium | 80 | 7.5 |
| 5 | DMARDs | 57 | 5.3 |
| 6 | Gastric acid inhibitor | 214 | 20.2 |

Overall drugs prescribed were



Analgesic distribution

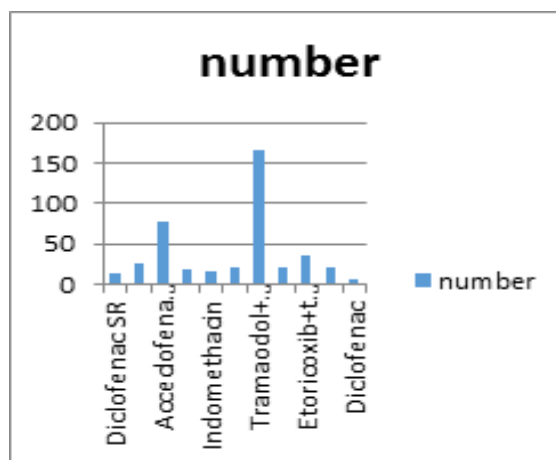


Table 1: Dosage forms of Analgesics, Muscle relaxants

| S. No | Dosage form | Analgesics | Number | % |
|------------|-------------|---|--------|------|
| 1 | Oral | Diclofenac SR | 14 | 3.3 |
| | | Diclofenac+paracetamol+serratiopeptidase | 25 | 5.9 |
| | | Acceclofenac+paracetamol+seratiopeptidase | 78 | 18.6 |
| | | Piroxicam | 18 | 4.3 |
| | | Indomethacin | 15 | 3.5 |
| | | Ibuprofen+paracetamol | 22 | 5.3 |
| | | Tramaadol+paracetamol | 165 | 39.4 |
| | | Tramadol+diclofenac | 20 | 4.7 |
| | | Etoricoxib+thiocolchicine | 36 | 10 |
| Pragabalin | 20 | 5 | | |
| 2 | Parenteral | Diclofenac | 5 | |
| 3 | Topical | Diclofenac+methyl sal./ Transdermal Fantanyl patches | 26 | |

Tab 2: Antimicrobials-on OPD basis only oral dosage forms are given

| S. No | Dosage form | Antimicrobial | Number | % |
|-------|-------------|----------------------------------|--------|----|
| 1 | Oral | Cefixime/cefepodoxime/cefuroxime | 82 | 40 |
| | | Amoxicillin+clavulonic | 62 | 30 |
| | | Clindamycin | 22 | 11 |
| | | Linezolid | 23 | 11 |
| | | Ofloxacin | 18 | 8 |

The frequency of drug administration was recorded in 100% of prescriptions. The duration of treatment was mentioned in 74% prescriptions.

WHO drug prescription indicators

1. Number of drugs per prescription
2. Percentage of generic drugs
3. Percentage of encounters with antibiotics
4. Percentage of injections
5. Percentage of essential drugs
6. Cost per prescription

Discussion

Polypharmacy is very common. Number of drugs per prescription is 5.3 which is higher than the WHO guideline of 2.02. Similar studies in other hospitals in India also confirm similar results (3 sridivya), Bithi 4.3%⁽¹³⁾ while in Ubedulla⁽⁴⁾ & Ingle⁽⁵⁾ studies it was around 3. 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.

Analgesics (39.6%), NSAID, Tramadol plus Paracetamol fixed drug combinations was more commonly prescribed than, Diclofenac, This was in alignment with muraiah.^(7,8) Choudhary DK study shows diclofenac to be more common.⁽¹⁴⁾

Topical gels containing Diclofenac, Methyl Salicylate, Transdermal Fantanyl patches are used in inflammatory conditions. Use of topical gels/

Transdermal patches of Fantanyl use in orthopedics while these are (relaxyl, zandu bam, Buvlar containing bupriganesic, duragesic containing fantanyl, voveron gel brand names) are commonly used in conditions like strains.

Co prescribed with Analgesics, Proton pump inhibitors (20.2%) were very commonly prescribed while in sridivya (17.5%) and kumars study.⁽⁹⁾

Multivitamins and calcium (5.3%) were in line with shankar's study.⁽¹⁰⁾

Drugs prescription by generic names is very low in this study (2%) similar to Patel study⁽¹⁵⁾ while WHO guideline is to prescribe drugs by generic names is 100%. while in sridivya⁽³⁾ studies it was 61%. Other studies^(4,5) 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. 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 19.6%. 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 very less than 1%. This is in conformation with WHO guideline of less than 10% injectable.⁽¹¹⁾ Similar to Afsan s study of 3%.⁽¹²⁾ Most of the drugs prescribed in OPD

practice are through oral route. Injectable are used more in admitted IPD, ward patients (46%).⁽³⁾

FDCs, fixed drug combinations in our study was around 40%, very high in OPD practice. This is more than srividya⁽³⁾ studies (18.5%). 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,⁽⁶⁾ antibiotics cause more adverse effects.

Drugs prescribed from NLEM was 84%.

Average cost per prescription is Rs.250 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.

Strength of the study -prospective study, large resources were required, better to research.

Limitations of the study -Single center study, study duration was 6 months, prospective study, people lose interest. Students helping in the study, change after some time. Again new students have to be explained whole process Monotonous.

Conclusions

Polypharmacy is very common. In OPD, cold orthopedics conditions, analgesics, gastric acid inhibitors and antimicrobials are generally given. Number of drugs per prescription is 5.3, higher than the WHO guideline of 2.02. Drugs prescription by generic names is very low in this study only 2% while WHO guideline is to prescribe drugs by generic names is 100%. Percentage of encounters with antibiotics is 20% while WHO guideline is to prescribe antimicrobials in only essential conditions after proper culture and sensitivity testing. Percentage of injectable given in OPD is well within WHO guideline of 10%. Average cost per prescription is Rs. 250 INR. Drugs prescribed from essential drug list was 84%. Topical gels containing Diclofenac, Methyl Salicylate, Transdermal Fentanyl patches are used in inflammatory conditions.

During undergraduate medical teaching, emphasis should be laid on Rational drug therapy.⁽¹⁵⁾ The mind of Undergraduate students is more receptive & adaptive for learning correct way to prescribe the drugs. These trained UGs would become tomorrow's Postgraduates in clinical specialties, will commit less mistakes, will write better prescriptions. For this pharmacology faculties should also visit orthopedics departments to know the various area of improvement. Pharmacologists and orthopedicians are/ should act complementary to each other in the patient's interest.

Regular CMEs/ workshops/ Lectures/ ward visits on Rational drug prescription should be held by pharmacologists for orthopedicians in a creative, indirect suggestive way, without hurting anyone's ego & self-

respect. Ultimate beneficiary is the patient. For the hospital the best interest is the patient's interest.

This type of study will help surgeons of orthopedics department/ pharmacologists/ health/ hospital care authorities in policymaking.

Competing interest: As author of this manuscript, I declare that I have no competing interest.

Contribution of authors: OPD Data was collected & filled in predesigned forms with the help of final year students posted in orthopedics under guidance of NA. Predesigned forms were provided & data was analyzed by WP with the help of RS & PP.

Abbreviations: DMARDs-disease modifying drugs for rheumatoid arthritis, EDL-essential drug list, NLEM-national model list of essential drugs, NA -Dr Nagla Ashok, WP- Wadagbalkar P, RS- Raipurkar S, PP-Patel Poonam.

Acknowledgment

Very thankful to Faculties & Postgraduate residents, final year medical students, OPD clerical staff of orthopedics, for helping, collecting data & filling the forms of the study.

Funding: Nil

IRB: Yes

References

1. Kaur S, Rajgopalan S, Kaur N, Shafiq N, Bhalla A, Pandhi P, et al. Drug utilization study in medical emergency unit of a tertiary care hospital in North India. *Emerg Med Int* 2014;973578.
2. WHO. How to investigate drugs use in health facilities: selected drug use indicators, Geneva, World Health Organization, 1993, WHO/ DAP/93 1993;1:1-87.
3. Srividya BP, Shashikumar NS, Amardeep G. Retrospective audit of prescription of drugs among inpatients of orthopedic wards at Medical College Teaching Hospital, Mandya. *Natl J Physiol Pharm Pharmacol* 2016;6:282-285.
4. Ubedulla S, Sekhar NC, Jayasree T, Shankar J, Rohit K. Prescription trends in department of orthopedics at tertiary care teaching hospital. *J Chem Pharm Res.* 2013;5(11):512-7.
5. P. Ingle, P. Patil, V. Lathi. Study of rational prescribing and dispensing of prescriptions with NSAIDs in orthopedic OPD. *AJPCR*, vol 8, issue 4, 2015.
6. Ramgopal. Prescription auditing and drug utilization pattern in a tertiary care teaching hospital of western UP. *Int J Basic Clin Pharmacol.* 2012;1(3):184-90.
7. Muraraiah S, Rajarathna K, Vishwanath M, Ramaswamy A, Kamath S, Seshu S, et al. Evaluation of WHO prescribing indicators among orthopaedic inpatients at a tertiary care hospital *J Chem Pharm Res.* 2014;6(8):278-80.
8. Elsy MI, Ajitha KN, Sanalkumar KB, Jyothish K, Kuttichira P. Prescribing pattern of analgesics in orthopaedic department of an Indian tertiary care teaching hospital in Kerala. *Kerala Med J.* 2011;4:149-520.

9. Kumar A, Dalai CK, Ghosh AK, Ray M. Drug utilization study of co-administration of non-steroidal anti-inflammatory drugs and gastroprotective agents in an orthopaedics outpatients department of a tertiary care hospital in West Bengal. *Int J Basic Clin Pharmacol.* 2013;2(2):199–202.
10. Shankar PR, Pai R, Dubey AK, Upadhyay DK. Prescribing patterns in the orthopaedics outpatient department in a teaching hospital in Pokhara, western Nepal. *Kathmandu Univ Med J.* 2007;5(1):16–21.
11. World Health Organization. International Network for Rational Use of Drugs and World Health Organization. How to Investigate Drug Use in Health Facilities: Selected Drug Use Indicators 1993. EDM Research Series No. 7 1993;192.
12. Afsan M, Haque MME, Alam MM, Noor N. Audit of prescribing practices to evaluate rational use of medicines in the OPD of orthopaedics in a private medical college hospital. *J Shaheed Suhrawardy Med Coll.* 2012;4(2):39–42.
13. Bithi et al, Drug Utilization study in orthopedic units, Dhaka, Bangladesh, *International current pharm journal*, August, 2014,3(9):315-321.
14. Choudhary DK, Bezbaruah BK. Prescription pattern of analgesics in orthopedic in patient department at tertiary care hospital in Guwahati, Northeast India, *Indian J Pharmacol* 2016;48:377-81.
15. Thawani V. Rational use of medicines: achievements and challenges. *Indian J Pharmacol.* 2010;42:63.
16. Patel V, Vaidya R, Naik D, Borker P. Irrational drug use in India: a prescription survey from Goa. *J Postgrad Med.* 2005;51(1):9–12.