

ASSESSMENT OF DRUG UTILIZATION PATTERN BY USING WHO PRESCRIBING INDICATOR AMONG INPATIENTS IN THE ORTHOPEDIC DEPARTMENT OF PUBLIC HOSPITALS IN RAJSHAHI, PABNA AND KUSHTIA DISTRICTS, BANGLADESH**Most. Reshma Akter^{1*}, Md. Raihan Parvez¹, Md. Shafiqul Islam², Mahfuza Khatun³, and Mst Mahmuda Akter³**¹Department of Pharmacy, Pabna University of Science and Technology, Pabna-6600, Bangladesh.²Department of Pharmacy, Bangabandhu Sheikh Mujibur Rahman Science and Technology University, Gopalganj-8100, Bangladesh.³B. Pharm (Professional) Student, Department of Pharmacy, Pabna University of Science and Technology, Pabna-6600, Bangladesh.***Corresponding Author: Most. Reshma Akter**

Department of Pharmacy, Pabna University of Science and Technology, Pabna-6600, Bangladesh.

Article Received on 10/02/2021

Article Revised on 01/03/2021

Article Accepted on 21/03/2021

ABSTRACT

Objective: The aim of this study was to analyze the prescribing pattern of analgesics and others medicines in the orthopedic inpatient departments of Rajshahi Medical College Hospital (RMCH), Pabna Medical Hospital (PMH) and Kushtia Medical Hospital (KMH), Bangladesh. **Materials and Method:** Prescriptions were randomly collected from the patients admitted in the orthopedic department and data were recorded using pre-designed questionnaire form. Data analysis was carried out by using MS Excel 2007 and summarized as counts and percentages. **Result:** A total of 231 patients, both male 160 (69.3%) and female 71(30.7%) were included. Total number of prescribed medicines was 1576, accounting 6.82 medicines per prescription. Among them, analgesics, antibiotics, calcium supplements, gastro-protective agents, and others were 360 (22.8%), 351 (22.3%), 67 (4.3%), 270 (17.1%), and 528 (33.5%), respectively. Of all the prescribed analgesics, NSAIDs (Non-Steroidal Anti-inflammatory Drugs) were 338 (94%). Compare to total antibiotics 351 (22.3%) prescribed, cefixime trihydrate, ceftriaxone, flucloxacillin, cefuroxime, ciprofloxacin, were 34 (9.7%), 134(38.2%), 127 (36.1%), 28 (8%), 7 (2%), and others 21 (6%) respectively. Calcium plus vitamin-D occupied the highest proportion (86.6%) of the prescribed calcium supplements. Proton pump inhibitors (PPIs) were the most frequently 270 (98.9%) prescribed gastro-protective agents. Data revealed that no medicine was prescribed by generic name. Maximum number of medicines (833, 52.9%) were prescribed to be administered by parenteral route and followed by oral (660, 41.9%), topical (4, 0.3%) and others routes (79, 5%), respectively. **Conclusion:** NSAIDs, especially ketorolac tromethamine was the most frequently prescribed analgesic in the orthopedic department followed by gastro-protective agents. Average number of medicines per prescription (6.82) was significantly higher than the WHO recommended values (1.6-1.8). For rational use of medicine, drug should be prescribed by generic name.

KEYWORDS: Prescription, Analgesics, NSAIDs, Orthopedic, Inpatients.**1. INTRODUCTION**

Orthopedics department of any hospital is very important unit where various drugs, especially analgesics, antibiotics, calcium supplement and gastro-protective drugs are routinely prescribed.^[1] Patients are there due to fracture, road accident, infective diseases, arthritis, congenital and other diseases. Irrational use of drugs leads to growth of various adverse effects in patients, leading to increased morbidity and mortality as well as increased expenditure of treatment.^[2] Unreasonable use of NSAIDs leads to gastrointestinal complication like hemorrhage, perforation, obstruction and other side effects.^[3,4]

For ensuring rational use of drugs, World Health Organization (WHO) recommended that patients receive medications as per their clinical needs, in right doses for an adequate period of time, at the lowest cost to them and their community.^[5] The prescription assessment in orthopedics needs to be on a regular basis monitoring, since most of the drugs prescribed carry inconvenient side effects. The studies of prescriptions in orthopedics outpatients department are available, but orthopedics inpatients are scarce. Drug utilization research studies conducted in the in-patient are effective tools that help in evaluating drug prescribing trends, efficiency, and cost-effectiveness of hospital formularies.^[6]

Our prescription analysis was thus carried out to explore the status of rational use of medicines that will ultimately help to improve the quality of health care system in Bangladesh.

2. METHODOLOGY

2.1 Study design

This area-based, cross-sectional study was conducted among 231 patients admitted in RMCH, PMH and KMH in the orthopedic departments. Data were collected for the period of four months (June– September) in 2020. All data were recorded by using pre-designed questionnaire form. All the questions were translated in Bengali while asking the participants for their easy understanding.

2.2 Statistical analysis

Descriptive statistics were applied to evaluate the collected data using Microsoft Excel 2007 software. Age and gender of participants, number and percentages of analgesics, antibiotics, calcium supplements, gastro-protective agents, and other medicines were calculated.

3. RESULTS

Of the total 231 patients, 160 (69.3%) were male and 71(30.7%) were female. Among the participants, 19 (8.2%), 39 (16.9%), 41 (17.7%), 36 (15.6%) 34 (14.7%), 35 (15.2%), 14 (6.1%) belong to the age range 01-10, 11-20, 21-30, 31-40, 41-50, 51-60, 61-70 years respectively; while 13 (5.6%) participants were >70 years. Among the participants 41(17.7%) were from urban and 190 (82.3%) were form rural. Prescriptions were collected from RMCH, PMC and KMC were 74 (32.1 %), 95 (41.1%) and 62 (26.8%) respectively.

A total number of medicines prescribed were 1576 with an average 6.82 medicines per prescription. Commonly prescribed medicines were analgesics 360 (22.8%), antibiotics 351 (22.3%), calcium supplements 67 (4.3%), gastro-protective agents 270 (17.1%), and others 528 (33.5%), included vitamins, muscle relaxants etc. (depicted in fig. 1).

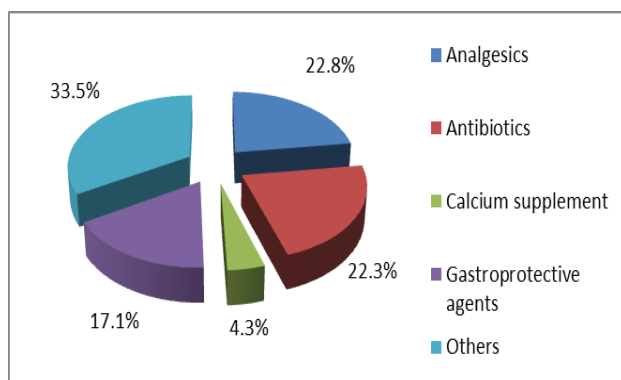


Fig. 1: Type of medicines prescribed in orthopedic in-patients.

Of the total analgesics, 338 (94%) were NSAIDs and 22 (6%) were steroidal analgesics.

Most frequently prescribed analgesic was ketorolac tromethamine 172 (47.8%) followed by diclofenac sodium 71(19.7%), aceclofenac 21 (5.8%), paracetamol 53 (14.7%), nalbuphine HCl 20 (5.6%) and others 23 (6.4%) that covered naproxaen sodium, ibuprofen, tramadol, etoricoxib, tenoxican, aspirin (Fig. 2).

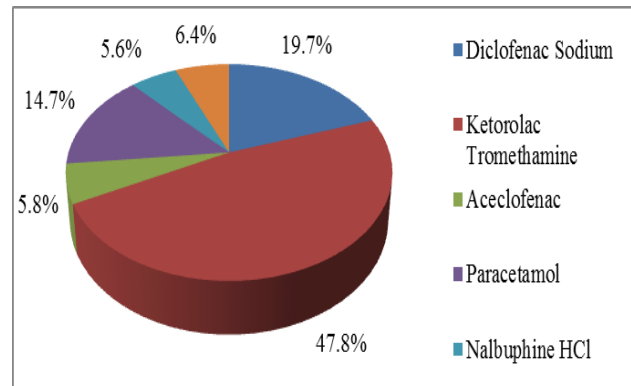


Fig. 2: Distribution of percentage of analgesics prescribed in orthopedic in-patients.

Of the total 351 prescribed antibiotics; cefixime trihydrate, ceftriaxone, flucloxacillin, cefuroxime, ciprofloxacin, were 34 (9.7%), 134(38.2%), 127 (36.1%), 28 (8%), 7 (2%), and others 21 (6%) respectively (Fig. 3).

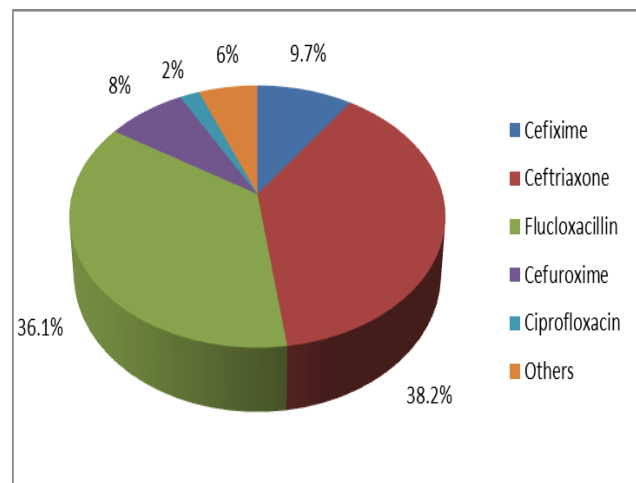


Fig. 3: Types of antibiotics prescribed in orthopedic in-patients.

Our study shown that total calcium supplement was 67, where 58 (86.6%) was prescribed with vitamin-D and only 9 (13.4%) as calcium (lactate, carbonate).

Most frequently prescribed gastro-protective agents were proton-pump inhibitors (PPIs) 270 (98.9%) along with antacid 2 (0.7%) and H₂-blocker 1 (0.4%). Among 270 PPIs; omeprazole, esomeprazole, pantoprazole and others were 145 (53.7%), 102 (37.8%), 10 (3.7%) and 13 (4.8%) respectively (Fig. 4).

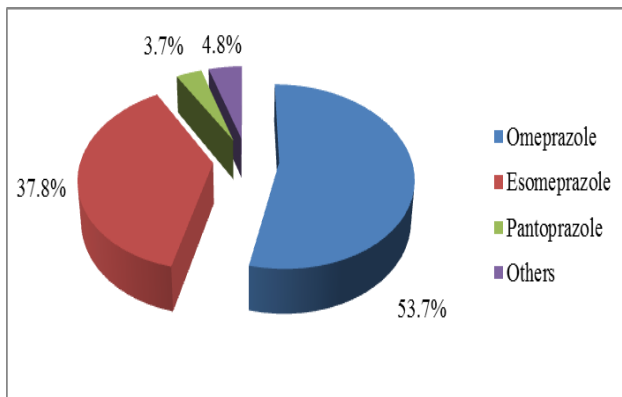


Fig. 4: Types of proton-pump inhibitors prescribed in orthopedic in-patients.

In this study it was observed that large number of medicines 833 (52.9%) were prescribed for administration by parenteral route and followed by oral 660 (41.9%), topical 4(0.3%) and others routes 79 (5%) respectively (Fig. 5).

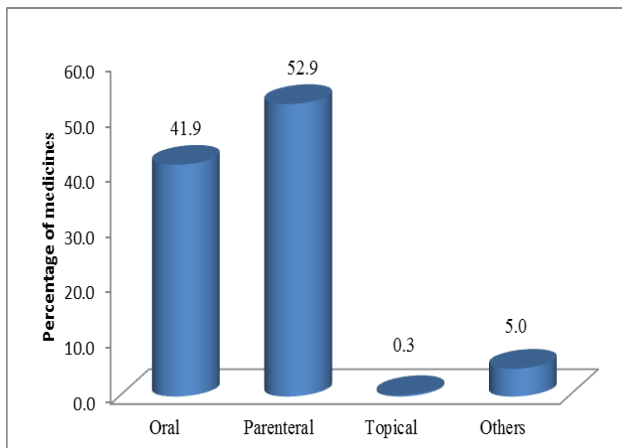


Fig. 5: Routes of administration of medicines prescribed in orthopedic in-patients.

4. DISCUSSION

In this retrospective study, we analyzed the prescriptions of in-patients in the orthopedic department of RMCH, PMH and KMH that included both male (69.3%) and female (30.7%) patients. The age range of the participants 01-10, 11-20, 21-30, 31-40, 41-50, 51-60, 61-70 and >70 years were 8.2%, 16.9%, 17.7%, 15.6%, 14.7%, 15.2%, 6.1%, 5.6% respectively. In 231 prescriptions, total number of prescribed medicines were 1576, which indicated that the average number of medicines per prescription (6.82) was significantly higher than the WHO recommended values (1.6-1.8) but aligned with earlier studies.^[7] Data uncovered that none of the medicines were prescribed by generic name. With analgesics (22.8%) most commonly prescribed medicines were antibiotics (22.3%), calcium supplements (4.3%), gastro-protective agents (17.1%), and others (33.5%) that included vitamins, muscle relaxants etc., which was concomitant with the earlier study.^[8]

The mean number of analgesic per prescription was 1.56 which was consistent with result (1.23 ± 0.49) obtained by previous study.^[9] For managing musculoskeletal disorder associated with pain and inflammation, NSAIDs are most commonly prescribed drugs.^[10,11] In this study, NSAIDs were most frequently prescribed drugs (94%) which were in accordance with the earlier studies.^[12,13] Ketorolac tromethamine (48%) was revealed as most frequently prescribed analgesic in our study.

Antibiotics prescribed to treat bone and soft tissue related infections (22.3%) were aligned with WHO prescribed indicator (20-26.8%). Cephalosporin found to be the most frequently (55.9%) prescribed antibiotics which was also concordance with a very recent study.^[14]

Calcium prescribed as calcium-vitamin-D combination (86.6%) for the patients suffering from bone related diseases was slightly lower than that found in a study done in India.^[15]

Generally, gastro-protective agents such as PPIs, H₂ – blockers and antacids are prescribed along with NSAIDs to reduce the gastrointestinal side effects. Our study found that PPIs (98.9%) were most frequently prescribed gastro-protective agents to minimize the gastric irritation and injuries that were allied to the previous study.^[16] Omeprazole (53.7%) was uncovered as the mostly prescribed PPIs in this study.

In contrast to the most preferable oral medications for outpatients,^[17] parenteral dosages form was the most frequently prescribed medicines (52.9%) followed by oral dosages form which was aligned with the study by Nagla A. *et al*^[12], but discrete with the study by Baghel R *et al.*^[18]

5. CONCLUSION

Our study reflects the pattern of prescribing medicines to the in-patients in the orthopedic department of RMCH, PMH and KMH. According to WHO, 100% percentage of drugs should be prescribed by generic name which was unfortunately 0% in practice, according to this study. This study revealed that the average number of medicines per prescription was significantly higher than WHO recommended values. Analgesics, especially NSAIDs were the most frequently prescribed medicines and gastro-protective agents were co-prescribed medicines. Ketorolac tromethamine and omeprazole were most commonly prescribed NSAIDs and gastro-protective agents, respectively. Cephalosporin was the most frequently prescribed antibiotics found in our study. Injection coverage for medication was found to be 52.9% which was much higher than the WHO guided range 13.4-24.15%. It indicates that importance should be given on prescribing medicines according to WHO recommended standards for rational use of medicines.

6. ACKNOWLEDGMENT

The authors are thankful to the Department of Pharmacy of Pabna university of Science and Technology and also the authorities of RMCH, PMH and KMH for their kind support to collect the data for conducting this survey-based research.

7. AUTHOR'S CONTRIBUTION

Most. Reshma Akter conceptualized the study, prepared the questionnaire, analyzed data and prepared manuscript. Md. Raihan Parvez collected data and helped in data analysis. Md. Shafiqul Islam helped in manuscript preparation and necessary correction. Mahfuza Khatun and Mst Mahmuda Akter formulated the present hypothesis. All of the authors checked and approved the final manuscript before submission.

8. CONFLICTS OF INTEREST

The authors declared no conflict of interest.

REFERENCES

1. Srividya BP, Shashikumar NS and Amardeep G. Retrospective audit of prescription of drugs among inpatients of orthopaedic wards at medical college teaching hospital, Mandya. *Natl J Physiol Pharm Pharmacol*, 2016; 6: 1-4.
2. Demeke B, Molla F, Assen A, Melkam W, Abrha S, Masresha B, *et al.* Evaluation of drugs utilization pattern using WHO prescribing indicators in Ayder Referral Hospital, Northern Ethiopia. *Int J of Pharma Sci and Res*, 2015; 6(2): 343-347.
3. Graumlich JF. Preventing gastrointestinal complications of NSAIDs. Risk factors, recent advances and latest strategies. *Postgrad Med*, 2001; 109(5): 117-128.
4. Smalley WE, Ray WA, Daugherty JR and Griffin MR. Nonsteroidal anti-inflammatory drugs and the incidence of hospitalization for peptic ulcer disease in elderly persons. *Am J Epidemiol*, 1995; 141: 539-45.
5. WHO, how to investigate drug use in health facility, drug use indicators, prescription indicators WHO/DAP/93, Geneva, WHO, 1993; 10.
6. Choudhury DK and Bezbaruah BK. Prescribing pattern of analgesics in orthopedic in-patient department at tertiary care hospital in Guwahati, Assam, Northeast, India. *Indian J Pharmacol*, 2016; 48: 377-81.
7. Abhilash S, Rashmi RR and Sivaguha YP. Assessment of prescribing pattern among orthopedic in-patients using who prescribing indicators. *Asian J of Pharm and Clin Res*, 2018; 11 (12): 505-509.
8. Rajarathna K, Vishwanath M, Ramaswamy A, Sneha DK, Seshu S, Hosthota A and muraraiah S. Evaluation of who prescribing indicators among orthopaedic inpatients at a tertiary care hospital. *J of Chem and Pharm Res*, 2014; 6(8): 278-280.
9. Kamaldeen AS, Omuya LM, Buhari ASM, Saka AO and Saka MJ. Evaluation of analgesics usage in pain management among physicians. *J Appl Pharm Sci*, 2012; 2(6): 194-198.
10. Bhaskar R, Veena DR, Padma L, Kumar PA and Moosaraza S. Prescription pattern of analgesics in orthopedics outpatient department at a tertiary care hospital. *Intl J Basic Clin Pharm*, 2015; 4(2): 250-253.
11. Builders MI, Okonta JM and Aguwa CN. Prescription patterns of analgesics in a community hospital in nsukka. *J Pharm Sci Res*, 2011; 3(12): 1593-1598.
12. Nagla A and wadagbalkar P. Prescription pattern study of drugs given to patients admitted in orthopedic wards of a rural medical college, a tertiary care hospital. *Euro J of Pharma and Med Res*, 2014; 1(1): 267-271
13. Hung CJ and Wu CC. Analgesics prescription patterns for orthopedic postoperative pain in Taiwan. *Euro J Pain*. 2009; 13: 184-285.
14. Yadav DK, Alam K, Sah AK and Sarraf DP. Utilization pattern of antibiotics and drug related problems in the orthopedic department at a tertiary care hospital: a prospective study. *J Drug Del Therap*, 2020; 10(3): 24-30.
15. Kulkarni M and Patil A. Drug utilization study in the orthopedics outpatient department of a tertiary care hospital in Maharashtra. *Asian J Pharm Clin Res*, 2018; 11(9): 224-226.
16. Manohar VS, Vinay M, Jayasree T, Kishan PV, Ubedulla S and Dixit R. Prescribing pattern of gastroprotective agents with non-steroidal anti-inflammatory drugs. *J Pharmacol Pharmacother*, 2013; 4(1): 59-60.
17. Tegegne A, Gashaw W and Kidane D. Prescribing pattern of analgesic drugs at Boru Meda Hospital, North East, Amhara, Ethiopia. *Pain Studies and Treatment*, 2017; 5: 37-43.
18. Baghel R, Adwal SK, Singh V and Chourishi A. Prescribing Pattern and drug utilization study in inpatients of department of orthopaedics in a rural teaching hospital of Ujjain, Madhya Pradesh, India. *Int J Basic Clin Pharmacol*, 2018; 7(9): 1763-1769.