



## **Assessment of drug utilization pattern among outpatients in the orthopedic department of several private clinics in Rajshahi city, Bangladesh**

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### **Abstract**

**Objective:** The aim of this study was to analyze the prescribing pattern of different analgesics and related medicines in the orthopedic outpatient departments of several private clinics in Rajshahi city, Bangladesh.

**Materials and Method:** Prescriptions were randomly collected from the patients attending in the orthopedic department and data were recorded in pre-designed data collection form. Data analysis was carried out by using MS Excel 2007 and summarized as counts and percentages.

**Result:** A total of 210 patients, both male 115 (54.8%) and female 95 (45.2%) were included. Total number of prescribed medicines was 883, accounting 4.2 medicines per prescription. Among them, analgesics, gastro-protective agents, calcium supplements, antibiotics and others were 30.5% (269), 23.8% (210), 9.3% (82), 7.4% (65) and 29.1% (257) respectively. Of all the prescribed analgesics, Non-steroidal anti-inflammatory drugs (NSAIDs) were 79.9% (215). Proton pump inhibitors (PPIs) were the most frequently (94.3%) prescribed gastro-protective agents. Calcium plus vitamin-D occupied the highest proportion (93.9%) of the prescribed calcium supplements. Compared to total antibiotics (65) prescribed; cefixime trihydrate, ceftriaxone, flucloxacillin, cefuroxime, ciprofloxacin, clindamycin HCl, linezolid and sodium fusidate were 8 (12.3%), 2 (3.1%), 17 (26.2%), 19 (29.2%), 3 (4.6%), 6 (9.2%), 8 (12.3%) and 2 (3.1%) respectively. Types of drug formulation used were oral (92.2%), parenteral (6.9%) and topical (0.9%) preparations.

**Conclusion:** Analgesics, especially NSAIDs were the most frequently prescribed medicine in the orthopedic department followed by gastro-protective agents. Number of medicines per prescription (4.2) was significantly higher.

**Keywords:** Analgesic, NSAIDs, orthopedic, outpatient, prescription

### **Introduction**

Rational use of medicine is essential to augment the therapeutic benefits and to minimize the adverse effects for ensuring patient's satisfaction. The rational use of medicines connotes that patients receive medicines appropriately to their therapeutic needs, in proper dose and dosage form to meet their individual requirements, for an adequate period of time, at lowest cost [1]. A prescription provided by a health care provider plays a vital role for the treatment of the patients [2]. It also provides insights into the nature of health care delivery systems [3]. However, the trend of prescription pattern may vary depending upon the age and gender of the patients, diagnosis, diseases severity, availability and cost of medicines.

The drug utilization pattern in the orthopedic department needs to be regularly monitored since most of the medicines prescribed here, may have adverse effects. In the orthopedic department most commonly prescribed medicines are analgesics, calcium supplements, gastro-protective agents and antibiotics [4]. It was found that NSAIDs were frequently prescribed analgesics at orthopedic which increase the risk of hospitalization and death due to gastrointestinal bleeding and perforation [5]. Irrational use of these medicines may cause serious adverse effect on the patients.

This prescription based study was thus carried out to facilitate the rational use of medicines and to improve the quality of health care to increase the patient's outcome [6].

### **Methodology**

#### **Study design**

This area-based, cross-sectional study was conducted among 210 patients coming in the orthopedic departments at private medical institutes situated in Rajshahi city. Data were collected for the period of three months (August – October) in 2019. All data were recorded by using pre-designed questionnaire form. All the questions were translated in Bangali while asking the participants for their easy understanding.

#### **Statistical analysis**

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

#### **Results**

Out of 210 prescriptions, 115 (54.8%) were from male and 95(45.2%) were from female patients. None of the patients were bellow 10 years of age. Among the total patients, 60 (28.6%) belongs to the age range 51-60 years; while 5 (2.4%), 25 (11.9%), 29 (13.8%) 43 (20.5%), 32 (15.2%) and 16 (7.6%) patients fall in the range of 11-20, 21-30, 31-40, 41-50, 61-70 and 71-80 years respectively.

A total number of medicines prescribed were 883 with an average 4.2 medicines per prescription. Commonly prescribed medicines were analgesics 269 (30.5%), gastro-protective agents 210 (23.8%), calcium supplements 82 (9.3%), antibiotics 65 (7.4%) and others 257 (29.1%) that included vitamins, sedative-hypnotics, muscle relaxants etc (depicted in fig. 1).

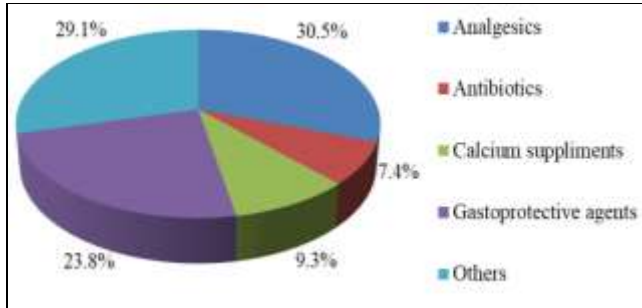


Fig 1: Type of medicines prescribed in orthopedic outpatients

Of the total analgesics, 215 (79.9%) were NSAIDs and 54 (20.1%) were steroidal analgesics. Most frequently prescribed analgesic was diclofenac 112 (41.64%) followed by naproxen 34 (12.64%), ketorolac 25 (9.29%), aceclofenac 24 (8.92%), paracetamol 23 (8.55%) and others 51 (18.96%) that covered ketoprofen, tramadol, etodolac, baclofen, etoricoxib, sulindac, aspirin and indomethacin (Fig. 2).

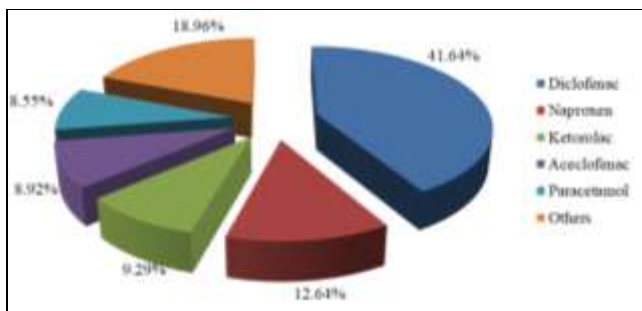


Fig 2: Distribution of percentage of analgesics prescribed in orthopedic outpatients

Most commonly prescribed gastro-protective agents were proton-pump inhibitors (PPIs) 198 (94.3%) followed antacids 12 (5.7%) but no H<sub>2</sub>-blocker interestingly. A total of 198 PPIs; esomeprazole, omeprazole and rabeprazole were 148 (74.7%), 46 (23.2%) and 4 (2%) respectively (Fig. 3).

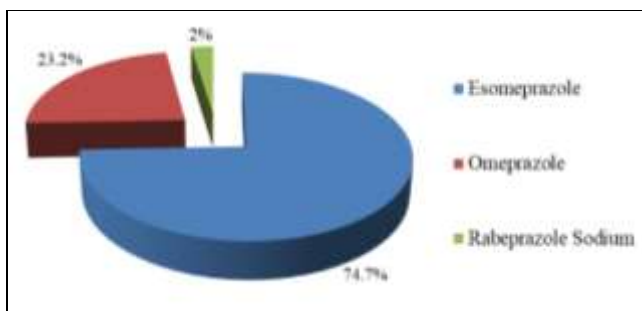


Fig 3: Types of proton-pump inhibitors prescribed in orthopedic outpatients

Calcium supplements usually prescribed in combination with vitamin-D were 77 (93.9%) whereas only calcium (as lactate, carbonate) were in 5 (6.1%) cases.

Of the total 65 prescribed antibiotics; cefixime trihydrate, ceftriaxone, flucloxacillin, cefuroxime, ciprofloxacin, clindamycin HCl, linezolid and sodium fusidate were 8 (12.3%), 2 (3.1%), 17 (26.2%), 19 (29.2%), 3 (4.6%), 6 (9.2%), 8 (12.3%) and 2 (3.1%) respectively (Fig. 4).

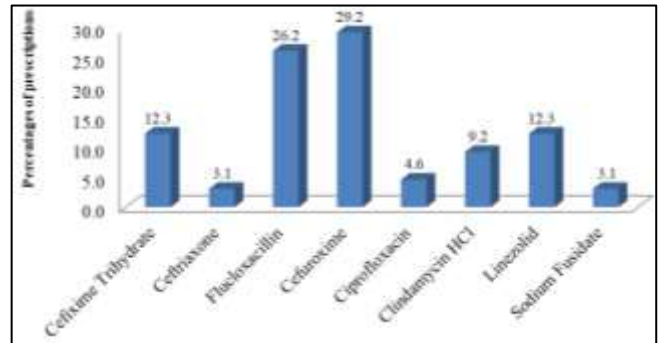


Fig 4: Types of antibiotics prescribed in orthopedic out-patients

Most of the medicines 814 (92.2%) were prescribed for administration by oral route followed by parenteral 61(6.9%) and topical 8 (0.9%) routes (Fig. 5).

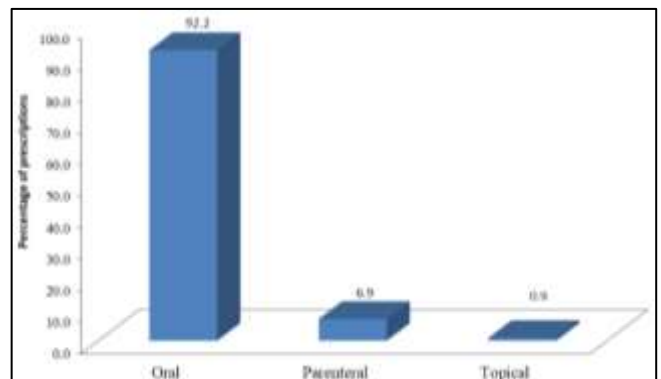


Fig 5: Routes of administration of medicines prescribed in orthopedic out-patients

**Discussion**

In this retrospective study, we analyzed the prescriptions of outpatients attending in the orthopedic department that included both male (54.8%) and female (45.2%) patients. The maximum numbers of patients belonged to the age range of 51-60 years.

In 210 prescriptions it was found that, the total number of prescribed medicines were 883, indicated the average number of medicines per prescription (4.2) was significantly higher than the WHO recommended values (1.6-1.8) but aligned with earlier studies [7, 8]. Data revealed that none of the medicines were prescribed by generic name. Along with analgesics (30.5%), most commonly prescribed medicines were gastro-protective agents (23.8%) followed by calcium supplements (9.3%) and antibiotics (7.4%) that showed coherence with similar findings [9]. The average number of analgesic per prescription was 1.28 which was consistent with result (1.23 ± 0.49) obtained by previous study in Nigeria [10].

For the management of musculoskeletal disorder associated with pain and inflammation, NSAIDs are most frequently prescribed drugs [11, 12]. In our study, NSAIDs were also the mostly prescribed drugs which were in accordance with the earlier studies [13, 14].

Diclofenac is the most commonly prescribed analgesic medication [15-18]. In our study too, diclofenac was found to be the most frequently prescribed NSAID that depicted concordance with similar previous study [19].

In common practices, gastro-protective agents such as PPIs, H<sub>2</sub>-blockers and antacids are prescribed along with NSAIDs to minimize the gastrointestinal side effects or disturbances. We found that PPIs (94.3%) were most prescribed gastro-protective agents to minimize the gastric irritation and injuries that were parallel to the previous study [20]. Esomeprazole (74.7%) was the mostly prescribed PPI in our study. Probably because of stronger and faster acid reducing capability, PPIs has been the drug of choice (100%) in place of H<sub>2</sub>-blockers.

Of the total calcium prescribed, 93.9% was as calcium-vitamin-D combination for the patients suffering bone related diseases which was aligned with the study done in Maharashtra, India [9].

Antibiotics are prescribed to cure bone and soft tissue related infections. In this study, fraction of prescribed antibiotics were 7.4% that was about two times higher than the result (3.8%) found by the study in Western Nepal [21]. We found that cephalosporin was the most frequently (44.62%) prescribed antibiotics which was concordance with a very recent study [22].

Oral formulation is the most preferable medication especially for outpatients [8, 20, 23]. In our study too, oral formulation was the most commonly prescribed (92.2%) medicines.

### Conclusion

Our study reflects the trend of prescribing medicines to the outpatients in the orthopedic department at several private clinics in Rajshahi city. Analgesics, particularly NSAIDs were most frequently prescribed medicines and gastro-protective agents were co-prescribed medicines along with analgesics. Diclofenac and esomeprazole were most commonly prescribed NSAIDs and gastro-protective agents respectively, in this study. This study revealed that the mean number of medicines per prescription (4.2) was about two times higher than WHO recommended values.

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### Author's contribution

Most. Reshma Akter conceptualized the study, prepared the questionnaire, analyzed data and prepared manuscript. Md. Khokon Miah Akanda collected data. Md. Shafiqul Islam and Md. Masud Rana formulated the present hypothesis, helped in manuscript preparation and necessary correction. All of the authors checked and approved the final manuscript.

### Conflicts of interest

The authors declare that they have no conflict of interest regarding the study.

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