
**DRUG USE AT CLINICAL HOSPITAL STIP-EVALUATION OF
RATIONAL/IRRATIONAL USE**

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Abstract: Introduction-According to WHO, rational use of medicines is defined as process that allows prescribing of the right drug for a right patient in the proper dose, duration of therapy, with the lowest cost for the patient and the community. Irrational drug use represents a major generator of progressively increasing costs in all health systems. (Holloway and Green, 2003). The aim of this study was to evaluate rational/irrational drug use at orthopedic department at Clinical Hospital Stip.

Materials and methods-A retrospective evaluation for the period of 6 months concerning to consumption of analgesics (Tramadol and Ketoprofen) and antibiotics (Ceftriaxon), was done. Total number of patients was 528 in evaluated period January-June 2015. The Evaluation of the therapy used in the study was according to the guidelines for evidence-based medicine issued by the Ministry of Health of RM for the treatment of diseases that are diagnosed in the test population. In order to detect discrepancies in the rational drug use for each of the evaluated drugs, DDD expressed per 100 hospital beds was calculated. The obtained data were statistically analyzed using SPSS.v.20 software licensed program.

Results and discussion-In Clinical hospital – Stip, annually expenditure for drugs is 500 000.00 euros and 7.1% belongs to the orthopedic department. 528 hospitalized patients in this department were included. The average age of evaluated patients was 57.14 ± 20.3 years and average time of hospitalization per patient was 7.74 ± 10.4 days. In most of the hospitalized patients diagnose was bone fracture and almost all patients received more than 4 drugs as parenteral therapy. The most commonly used analgesic for the pain control treatment were Amp. Ketoprofen and Tramadol and they were applied in almost all patients much longer than recommendations of 5 days. Regarding to the use of antibiotics for prophylaxis in orthopedic patients we found that ceftriaxone was mostly used antibiotic values for DDD/HHB from 26.24 to 42.74 and in all evaluated period the period of using of this antibiotic was more than 2 days.

Conclusion-Evaluation of the drug consumption at orthopedic department at Clinical Hospital Stip indicates irrational drug use in terms of all monitored indicators and recommendations for rational use of medicines. proper dose, duration of therapy, with the lowest cost for the patient and the community.

Keywords-irrational, rational, analgesics ,antibiotics, patients

INTRODUCTION

Rational use of medicines is defined as „ process that allows prescribing of the right drug for a right patient in the proper dose, duration of therapy, with the lowest cost for the patient and the community". The rational drug use is of great importance for medical, socio-economic and legal aspects. (W.H.O..1985) [1] If the process of drug prescribing is properly monitored then demands for rational drug use will be met. Unfortunately, in the real world prescribers not always adhere to the requirements for rational drug prescribing. This can be defined as inappropriate or irrational prescribing, and for some authors is called pathological drug prescribing. (W.H.O. 2002) [2] (Hogerzeil H 1995) [3]. Worldwide more than 50% of all medicines are prescribed, issued, or sold inappropriately. The most common reasons for the irrational drug use are: using too much medication per patient, improper use of antibiotics (inadequate intake for non-bacterial infection), use of the wrong medication for specific condition, drug use with questionable effectiveness, using a drug with uncertain security status, excessive use of parenteral formulations, where the use of oral formulations is more appropriate, inappropriate self-medication. Irrational drug use represents a major generator of progressively increasing costs in all health systems. This is a major problem especially in poorer countries that have small health budgets. (Kathleen Holloway; Terry Green 2003) [4]

In 1981, the WHO Regional Office for Europe recommended the ATC/DDD system for international drug utilization studies (Norwegian Institute of Public Health, 2010). The WHO Collaborating Centre for Drug Statistics Methodology was accordingly established in Oslo in 1982, and was directly linked to the WHO Headquarters in Geneva in 1996 (WHOCC, 2011). The purpose of the ATC/DDD system of classification is to serve as a tool for drug utilization research in order to improve quality of drug use. In the Anatomical Therapeutic Chemical (ATC) classification system, the active substances are divided into different groups according to the organ or system on which they act and their therapeutic, pharmacological and chemical properties (Norwegian Institute of Public Health, 2010).

The Defined Daily Dose (DDD) is the assumed average maintenance dose per day for a drug used for its main indication in adults (WHOCC, 2011). DDDs are a statistical measure of drug consumption, and are used to

standardize the comparative usage of various drugs between themselves or between different health care environments.[5,6] Taking into account all this, we set the evaluation of rational / irrational drug use at Orthopedic Department in Clinical Hospital Stip.

MATERIALS AND METHODS

The choice of this department is done on the basis of data for drug consumption, according to which the drug consumption at this department covers 2,351,242.86 denars or 7.1% of total drug consumption in Clinical Hospital Stip where annually for drugs are spend 30 000 000,00 denars from the hospital budget. A retrospective evaluation was performed for a period of 6 months. The consumption was monitored by evaluating the histories of disease and therapeutic lists for 528 patients. Data on sex, age of the patient, diagnosis, the type of intervention (surgical or conservative), applied therapy regimen during hospitalization and duration of hospitalization were analyzed. Of the total prescribed and administered drugs in all patients, selection was made and evaluation was conducted for used analgesics (Tramadol and Ketoprofen), and antibiotics (Ceftriaxon). The choice of this therapy was based on previous studies which suggest irrational use of these groups of drugs. Evaluation of the therapy used in the study was according to the guidelines for evidence-based medicine issued by the Ministry of Health of RM (www.fzo.org.mk)[7] for the treatment of diseases that are diagnosed in the test population. For the diagnoses for which there is not recommended guidelines, were used guidelines by European and American Associations for the treatment of given diseases. [Silvy Laporte 2014, Baglin T 2010, Geerts WH 2008, Scottish Intercollegiate Guidelines Network (SIGN) 2008, Buvanendran A 2009, Dolin SJ et al 2009, www.moh.gov.mk] For quantitative comparison of applied doses in patients were used individually prescribed daily Defined Doses of WHO Collaborating Centre for Drug Statistics Methodology (www.whocc.no). In order to detect discrepancies in the rational drug use for each of the evaluated drugs was calculated defined daily dose (DDD) expressed per 100 hospital beds. This unit is quite useful for benchmarking in hospitals.

Total drug dose in mg (during the evaluation period) X 100 / DDD X hospital days in the period X number of hospital beds X index of utilization.

For the statistical analysis of the obtained data was used SPSS.v.20 software licensed program that were derived following statistical tests: categorical variables are presented in absolute and relative numbers while for displaying quantitative variables were used descriptive statistics to calculate the mean \pm SD, median and minimum and maximum.[5,6,8,9,10]

RESULTS AND DISCUSSION

Results showed that at the Surgical department in the Clinical Hospital- Stip for the period January - June 2015 were hospitalized 528 patients. Most of these patients 62.64% were treated conservatively, and 37,36% patients by surgery. The average age was $57,14 \pm 20,3$ years and average time of hospitalization per patient was $7,74 \pm 10,4$ days. In most of the hospitalized patients diagnose was bone fracture and almost all patients received more than 4 drugs as parenteral therapy. The most commonly used analgesic for the pain control treatment was Ketoprofen in the form of ampulla. Ketoprofen, a drug belonging to the family of non-steroidal anti-inflammatory drugs (NSAIDs) has shown to be an excellent choice of drug for the treatment of chronic pain and effective also for the treatment of post-operative pain, particularly in the orthopaedic field, with an efficacy similar to opioids. In this setting, some evidence indicates that ketoprofen exhibits additional important benefits, showing to be effective in the prophylaxis of heterotopic calcification following hip or pelvic major intervention, without affecting the bone healing process. Ketoprofen is effective and well tolerated, through different administration routes, for the treatment of various forms of rheumatic, traumatic and post-surgical pain, and may therefore be considered as a valid therapeutic option for these patients. (P. Sarzi-Puttini et al . 2010).

Results showed that comparing all six month, In April 41(43.16%) patients of 95 received Ketoprofen of which 16 (39.02%) received more than 5 days. In April were used 18.82 DDD. April is the month with highest extra cost for Ketoprofen of 32,74%. In fact, ketoprofen was applied in almost all patients who were hospitalized at the orthopedic department at the Clinical Hospital Stip, much longer than recommendations of 5 days and parenteral form of the drug is not replaced with an oral form.

When analyzing the application of Tramadol. The use of this analgesic with central acting compared to other opioid and nonopoid agents have been studied in many clinical studies that confirmed that Tramadol is equally effective as Pethidine (meperidine), (www.who.int, 2006). Tramadol enhances inhibitory effects on pain transmission at the spinal level blocking nociceptive signal transduction both by opioid and monoaminergic mechanisms. Tramadol has been shown to provide effective analgesia after intravenous and oral (in a few of newer clinical studies) administration for postoperative pain management (G. Ulufer Sivrikaya, 2012).

The recommendation is parenteral formulation should be replaced as quickly as possible in oral form. (www.who.int, 2006). In January of 70 patients, 41 (58.57%) received Tramadol of which 22 (53.66%) received Tramadol more than 4 days. In January were used 11.35 DDD and January is the highest extra cost of 55,7%.

The use of antibiotics for prophylaxis in orthopedic patients is indicated when incorporating artificial materials, especially when incorporating artificial hips and knees. As antibiotic of choice is recommended cefazolin (first-generation cephalosporin). The use of antibiotics in prophylactic purposes is one of the numerous measures to reduce the risk of surgical site infections, which are common intra-hospital infections in surgical patients. (Raquel Queiroz; 2005). At the Orthopedic department cephalosporin are usually prescribed probably because of lower toxicity and wide antibacterial spectrum of activity. Ceftriaxone (third generation cephalosporin) is the most widely used antibiotic primarily due to longer duration of action and therefore cover a number of serious infections. The use of first generation cephalosporin cefazolin is much less expensive in terms of third generation cephalosporin Ceftriaxone, but cefazolin is not in our hospital formulary. The preoperative administration of a single 1 gm dose of Ceftriaxone for Injection, may reduce the incidence of postoperative infections in patients undergoing surgical procedures classified as contaminated or potentially contaminated (<http://www.drugs.com/>) Analyzing all six months, in January, 36 (51.43%) received Ceftriaxone. Of these, 30 (83.33%) had received antibiotics for more than 2 days. In January were used 39,43 DDD, so the extra cost was highest in January 46.02%.

CONCLUSION

Evaluation of the drug consumption at Orthopedic Department at Clinical Hospital Stip showed that the drug use which was analyzed is irrational in terms of all monitored indicators and recommendations for rationalization of use: duration of treatment, avoiding parenteral administration and replacement with an oral dosage form, unnecessary use of antibiotics, irregular monitoring of vital parameters during certain therapies, Individual assessment of patients Poly pharmacy at this Department can be somewhat justified by the co-morbidity of hospitalized patients which are usually older than 60 years, but still have to find a balance between the numerous prescribed medications and effective pharmacotherapy. Poly pharmacy can increase the number of drug interactions, and the number of problems associated with the drug use. To rationalize the drug use in the future, must be ensure regular monitoring and assessment of medication use, education of health professionals, applying the recommendations of clinical guidelines, preparing own clinical guidelines and procedures, application of pharmaco-economic analyzes and mandatory participation of a pharmacist in the team for the decisions making process.

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