Abstract

Analysis of the possibilities of influencing antibiotic prophylaxis in orthopedics on the basis of inflammatory markers

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Introduction and aim: Endoprosthetic surgeries are demanding orthopedic surgeries rarely associated with complications, that can be fatal. One is periprosthetic joint infection (PJI), whose risk can be decreased by antibiotic prophylaxis (AP). The aim of this effort was to describe trends in endoprosthetic surgeries of the knee and the hip, their complications and options of diagnostics in the theoretical part. The aim of the practical part was to analyze prognostic features of chosen laboratory parameters on postoperative infections, respectively on postoperative complications.

Methods: This prospective study started in March 2020 and data gathering took place until 28. 3. 2022 at the Ortopedic Clinic of the University Hospital Hradec Králové. Patients, who were included in the study, fulfilled the preliminary criteria, e.g. age ≥ 18 years, patient undergoing total hip or knee arthroplasty at the time of the study and giving the informed consent to the study. Data were gathered from health documentation of patients and the hospital information system. Data included information about: the patient, the surgery, thromboprophylaxis, AP and results of in advance defined physical and laboratory parameters. Specifically it was about C-reactive protein (CRP), neutrophil to lymphocyte ratio (NLR) and levels of albumin. Retrieved data were converted to a tabular format in the program Microsoft Excel and methods of descriptive statistics were used for their evaluation. The other statistical outcomes were made by „receiver operating characteristic" (ROC) curves for the evaluation of the association between laboratory parameters and surgery complications.

Results: 100 patients (51 men and 49 women) participated in the study with mean age of 65,2 ± 9,04 years. For AP, cephazoline was used in 83 cases and vankomycin was used in 17 cases. PJI has developed just by one patient. Also one superficial infection, one dehiscence of the wound, one infection of the urinary tract, one periprosthetic fracture and two pulmonary embolisms were registered. Area under the curve (AUC) of ROC curve of CRP by sampling 2 days after surgery in association with infection at the surgical site (SSI) reached value of 0,597, while AUC of ROC curve of NLR was 0,694.

Conclusion: It was discovered that most of measured parameters report certain predictive abilities on SSI and postoperative complications. Results imply that in an early postoperative period NLR could be more reliable indicator of SSI than routinely used CRP. However, due to the small sample size, such a conclusion would need to be verified by a larger study.