PROGNOSTIC VALUE OF PREOPERATIVE LYMPHOCYTE RATIO IN HOSPITALIZED GERIATRIC PATIENTS WITH EXTRACAPSULAR HIP FRACTURES: PRELIMINARY RESULTS

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PROGNOSTIC VALUE OF PREOPERATIVE LYMPHOCYTE RATIO IN HOSPITALIZED GERIATRIC PATIENTS WITH EXTRACAPSULAR HIP FRACTURES: PRELIMINARY RESULTS (Abstract) Despite the development of modern implants and multidisciplinary approach to extracapsular proximal femoral fractures in the geriatric population, mortality remains high. Our aim is to identify the factors that influence the mortality of these patients to optimize their treatment. Material and methods: We analyzed for 12 months’ geriatric patients with extracapsular fractures of the proximal femur in terms of age, sex, place of origin, type of fracture, treatment type, duration of preoperative interval variation of hematological values and in-hospital mortality. Results: We identified 262 geriatric patients with a mean age of 76.29 years ± 12.14. Sex ratio was 2/1 for the female patients. 7/224 (3.1%) of operated patients and 9/38 of functional treated patients (15.8%) died during hospitalization (p=0.005). The duration of preoperative interval ranged between 1 and 19 days, with no significant differences in the average recorded types of fractures (p=0.355). In the case of deceased patients, we noticed a slight decrease in lymphocytes count, while operated patients, recorded a slight increase (p=0.091). ROC curve showed the best predictability of the percent lymphocyte ratio for mortality (AUC=65%; IC95: 0.523-0.777). Conclusions: Preoperative lymphocyte ratio may be a prognostic factor for mortality during hospitalization of geriatric patients with extracapsular fractures of the proximal femur. Keywords: LYMPHOCYTE, HIP FRACTURE, MORTALITY, GERIATRIC, PROGNOSIS.

Trochanteric fractures represent a significant source of morbidity and mortality for geriatric population despite development of modern implants and multidisciplinary approach (1).

Despite numerous attempts to outline the factors influencing mortality during hospitalization, the results were inconclusive. Several factors were considered: patient age (2, 3), associated comorbidities (4) delay of surgery (5-7), hemoglobin level at admission (8), nutritional status (9-10). The purpose of the study was to determine the prognostic value of preoperative lymphocyte ratio for mortality during hospitalization for geriatric patients with extracapsular fractures of the proximal femur.

MATERIAL AND METHODS
We reviewed all consecutive geriatric patients with extracapsular fractures of the proximal femur, admitted to Orthopedic
Clinic of “Sf. Spiridon” County Clinical Emergency Hospital from Iasi between January and December 2015. We analyzed demographic characteristics of patients, type of fracture, type of treatment, preoperative interval, hematological profile at admittance and preoperative day and mortality during hospitalization.

Data were collected from patients’ clinical observation sheets and by using Unique Integrated Information System (UIIS). A two-sided p - value of 0.05 was considered significant for all tests. All analyses were conducted using SPSS 21.0 (SPSS, Inc., Chicago, IL, USA).

RESULTS

We identified 262 geriatric patients with a mean age of 76.29 ± 12.14 years. The gender distribution highlights the increased number of female patients (66.4%), sex ratio is 2/1; 88.5% of basicervical fractures, 78.6% of complex trochanteric fractures, 65.6% of fractures pertrochanteric and 63.6% of trohantero-diaphyseal fractures were women, while in males prevails avulsion fractures of the trochanter (54.5%) and intertrochanteric fractures (53.8%) (p=0.05). 57.1% of patients were from rural areas.

In this study group, 85.5% of patients were operated and 14.5% received functional treatment; 7/224 (3.1%) patients operated and 9/38 patients treated functionally (15.8%) died during hospitalization (p=0.005) (fig. 1, 2).

Among deceased patients during hospitalization (n=13), 69.5% were pertrochanteric fractures and 30.8% basicervical fractures (p=0.035).

Distribution of cases by age showed no significant differences depending on the type of treatment used and the evolution during hospitalization (p=0.551).

Operated patients were more frequently engaged in age groups 70-79 years (29.5%) and 80-89 years (41.1%).

Among patients with functional treatment, 39.5% were aged 80-89 years. Most deaths were noted in patients aged 80-89 years (61.5%) (fig. 3, 4).

Fig. 1. The percentage of survival according to type of treatment

![Bar chart showing survival percentages by type of treatment.]

Fig. 2. Type of treatment in the cohort

![Pie chart showing treatment distribution.]

Surgical treatment 85.5%

Functional treatment 14.5%
Preoperative interval ranged from 1 to 19 days, with no significant differences between types of fractures (p=0.355): the highest average value was found in 9 patients with fractures diaphyseal extension (6.56 ± 4.19 days). The lowest preoperative interval was found in patients with intertrochanteric fractures (3.73 ± 1.56 days).

Variation of hematological values was not statistically significant for the deceased patients except lymphocytes ratio.

Although the number of lymphocytes at the time of operation recorded an average grown compared to admission, the differences were not significant (1.27 vs. 1.81; p=0.143) (fig. 5).

During hospitalization, patients with functional treatment recorded decrease of the percentage of lymphocytes by an average of about 11 units, while patients operated recorded decrease about 10 units. Deceased patients have registered a decrease by 7 units (p=0.463).

In patients with functional treatment and deceased we observed a slight decrease in lymphocytes count and a slight increase in operated patients (p=0.091) (fig. 6)

ROC curve highlights the best predictability of lymphocyte ratio for mortality (AUC=65%; CI95: .523-.777). The remaining parameters do not provide statistically acceptable predictability (AUC<0.600) (fig.7).
Fig. 5. Evolution of the average level of lymphocytes

Fig. 6. The average level of lymphocyte per the method of treatment and survival

Fig. 7. The ROC Curve
DISCUSSION
This study analyzes the factors that influence hospital mortality of geriatric patients with extracapsular fractures of the proximal femur.

Our results regarding the influence of gender on mortality were in discrepancy with the literature (1-4, 11-12): we have noticed an increased mortality among female patients.

Influence of preoperative interval on mortality is a controversial topic, results of studies being discrepancy (5-7). In our study, we did not find a link between mortality and duration of preoperative interval and we recommend appropriate preoperative detrimental to surgery in the first 24 hours.

Our results regarding the influence of lymphocytes count on mortality, although inconclusive, confirmed results described by Kumar (9), among deceased patients were recorded lower values of lymphocytes with about 7 units (p=0.463). Lymphocyte ration was a significant predictor for mortality within hospital stay.

CONCLUSIONS
Present study demonstrates the prognostic value of the variation of lymphocytes percentage in assessing the risk of death during hospitalization geriatric patients with extracapsular fractures of the hip.

REFERENCES