

## The Neutrophil-to-Lymphocyte Ratio after Surgery for Hip Fracture in a New, Simple, and Objective Score to Predict Postoperative Mortality

**Authors :** Philippe Dillien, Patrice Forget, Harald Engel, Olivier Cornu, Marc De Kock, Jean Cyr Yombi

**Abstract :** Introduction: Hip fracture precedes commonly death in elderly people. Identification of high-risk patients may contribute to target patients in whom optimal management, resource allocation and trials efficiency is needed. The aim of this study is to construct a predictive score of mortality after hip fracture on the basis of the objective prognostic factors available: Neutrophil-to-lymphocyte ratio (NLR), age, and sex. C-Reactive Protein (CRP), is also considered as an alternative to the NLR. Patients and methods: After the IRB approval, we analyzed our prospective database including 286 consecutive patients with hip fracture. A score was constructed combining age (1 point per decade above 74 years), sex (1 point for males), and NLR at postoperative day+5 (1 point if >5). A receiver-operating curve (ROC) curve analysis was performed. Results: From the 286 patients included, 235 were analyzed (72 males and 163 females, 30.6%/69.4%), with a median age of 84 (range: 65 to 102) years, mean NLR values of 6.47+/-6.07. At one year, 82/280 patients died (29.3%). Graphical analysis and log-rank test confirm a highly statistically significant difference ( $P<0.001$ ). Performance analysis shows an AUC of 0.72 [95%CI 0.65-0.79]. CRP shows no advantage on NLR. Conclusion: We have developed a score based on age, sex and the NLR to predict the risk of mortality at one year in elderly patients after surgery for a hip fracture. After external validation, it may be included in clinical practice as in clinical research to stratify the risk of postoperative mortality.

**Keywords :** neutrophil-to-lymphocyte ratio, hip fracture, postoperative mortality, medical and health sciences

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