

The accuracy of serum-calprotectin as a diagnostic marker for infection concurrent to fall-related fractures in the elderly: a prospective longitudinal cohort study

Alicia Persson¹, Helmi-Sisko Pyrhönen², Johan Tham³, Linnea Malmgren⁴, Cecilia Rogmark²

¹ Faculty of Medicine, Lund University, Malmö, Sweden, ² Skåne University Hospital, Dept. of Orthopaedics. Faculty of Medicine, Lund University, Malmö, Sweden, ³ Skåne University Hospital, Dept. of Infectious, ⁴ Skåne University Hospital, Dept. of Geriatrics. Faculty of Medicine, Lund University, Malmö, Sweden.

Background/Aim: Hip fractures are associated with excess mortality. Infectious complications worsen the prognosis. Common biomarkers like C-reactive protein (CRP), procalcitonin (PCT), and white blood cells (WBC) may not be accurate in diagnosing infection during postfracture/-surgery inflammation. We aimed to assess if serum-calprotectin, a newer biomarker, was a more accurate marker of infection in elderly hip fracture patients than conventional biomarkers.

Method: In a prospective cohort study at our Department of Orthopaedics, 342 eligible patients were admitted between 2023-05-01 and 2024-03-11, with hip fractures after fall. Of these, 79 had day 3 postsurgery biomarkers taken. CRP, PCT, WBC, and calprotectin levels were compared between the groups with or without infection. The area under the curve (AUC) was calculated. Optimal cut-off values were determined using a receiver operating characteristics analysis and odds ratio (OR), calculated in a univariate logistic regression.

Result: Infection within 30 days occurred in 20 patients (25%). 5 patients had pneumonia, 8 UTI, and 1 bacteraemia. 8 had infections of unknown origin. WBC had the highest AUC (0.75, 95% CI:0.62-0.88), followed by calprotectin (0.70, 0.56-0.84). CRP and PCT showed low accuracy for infections. The optimal calprotectin cut-off value was 3.58 (sensitivity 0.75, specificity 0.66). OR for infection was 5.8 (1.9-18.4) at this value.

Conclusion: Serum-calprotectin was a more accurate marker than CRP and PCT but not WBC when taken on 3rd postoperative day. Further studies are needed to evaluate the role of calprotectin in a clinical setting.