

Title: Risk Factors for In-Hospital Mortality in Geriatric Patients with C2 Vertebral Fractures: An Analysis of Concomitant Diagnoses and Treatment Strategies in 10,077 Cases.

Background

C2 vertebral fractures in elderly patients are a common injury, associated with high mortality rates.

Research question

Is there an association between the type of treatment, comorbidities, concomitant injuries, and procedures with in-hospital mortality?

Design

Nationwide, retrospective cross-sectional study.

Methods

Data were extracted from the German InEK GmbH database covering the years 2019 through 2021. Patients with C2 vertebral fractures, aged 80 years or older, were divided into two groups; surgically treated and non-surgically treated. The association between potential risk factors, including comorbidities, concomitant injuries, and procedures, and in-hospital mortality was analyzed using odds ratios (OR) with 95% confidence intervals (95%CI).

Results

A total of 10,077 C2 vertebral fracture cases were analyzed. The in-hospital mortality rate was 8.4%, with no statistically significant difference in mortality rates between surgically treated (9.4%) and non-surgically treated patients (7.9%; $p=0.103$). Comorbidities, such as chronic kidney disease, dementia, and severe motor dysfunction were associated with higher in-hospital mortality. Traumatic brain injuries, C1 and subaxial vertebral fractures, and rib cage fractures, were indicators for in-hospital mortality. 31.5% (N=3,178) of patients were treated surgically, with a mono-segmental screw fixation being the most frequently applied procedure (44.2%). The only procedures associated with a

decreased OR were mono-segmental screw-rod fixation (OR=0.74; $p=0.044$) and the use of intraoperative navigation (OR=0.45; $p<0.01$).

Discussion

The study highlights the importance of comorbidities and concomitant injuries as risk factors for in-hospital mortality in elderly patients. Fixation with a mono-segmental screw-rod system and the use of intraoperative navigation might be associated with a decreased risk. The findings can aid in clinical patient-centered decision-making and complication prevention.