

Fracture patterns in patients with multiple fractures: the probability of multiple fractures and the most frequently associated regions

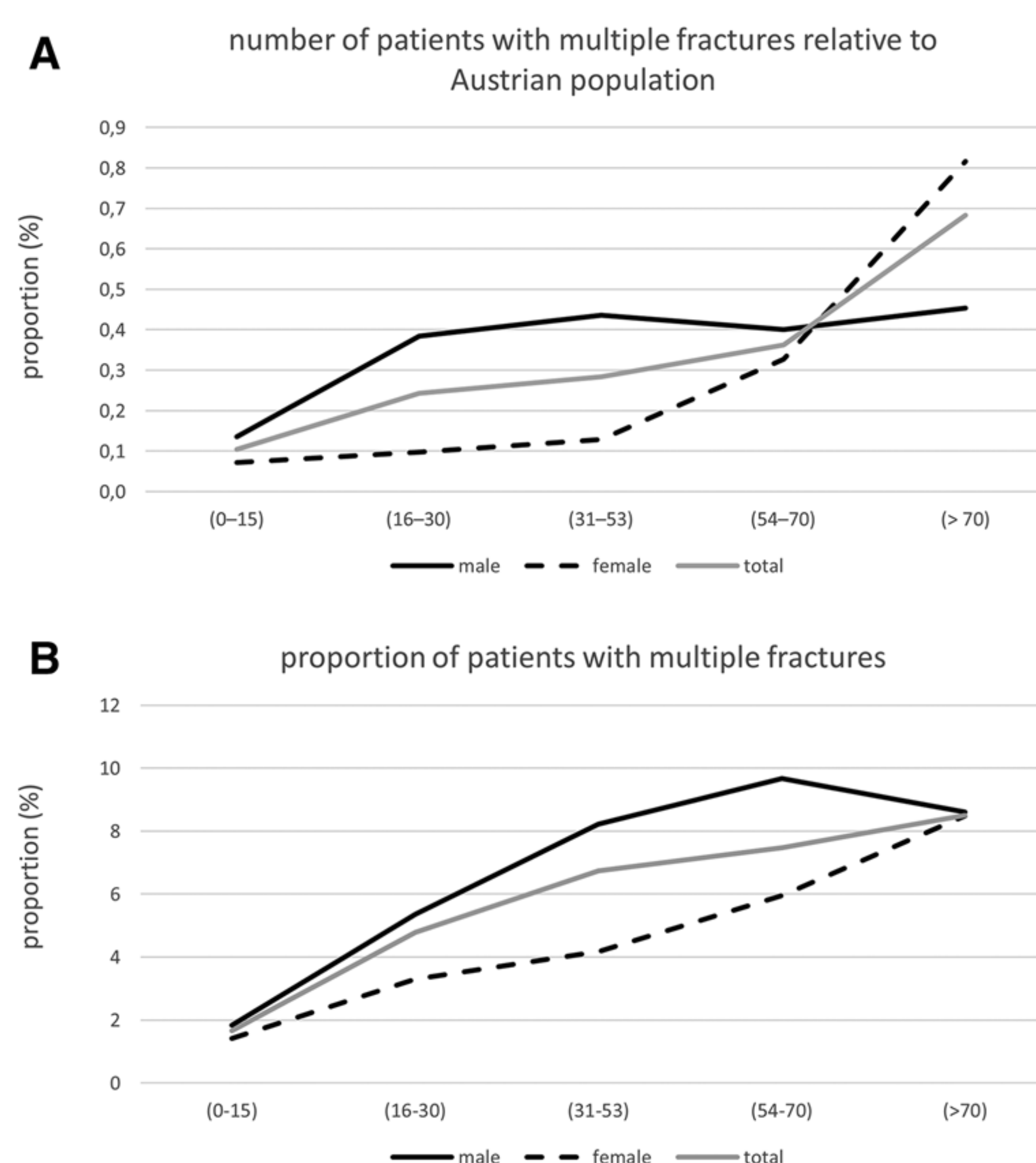
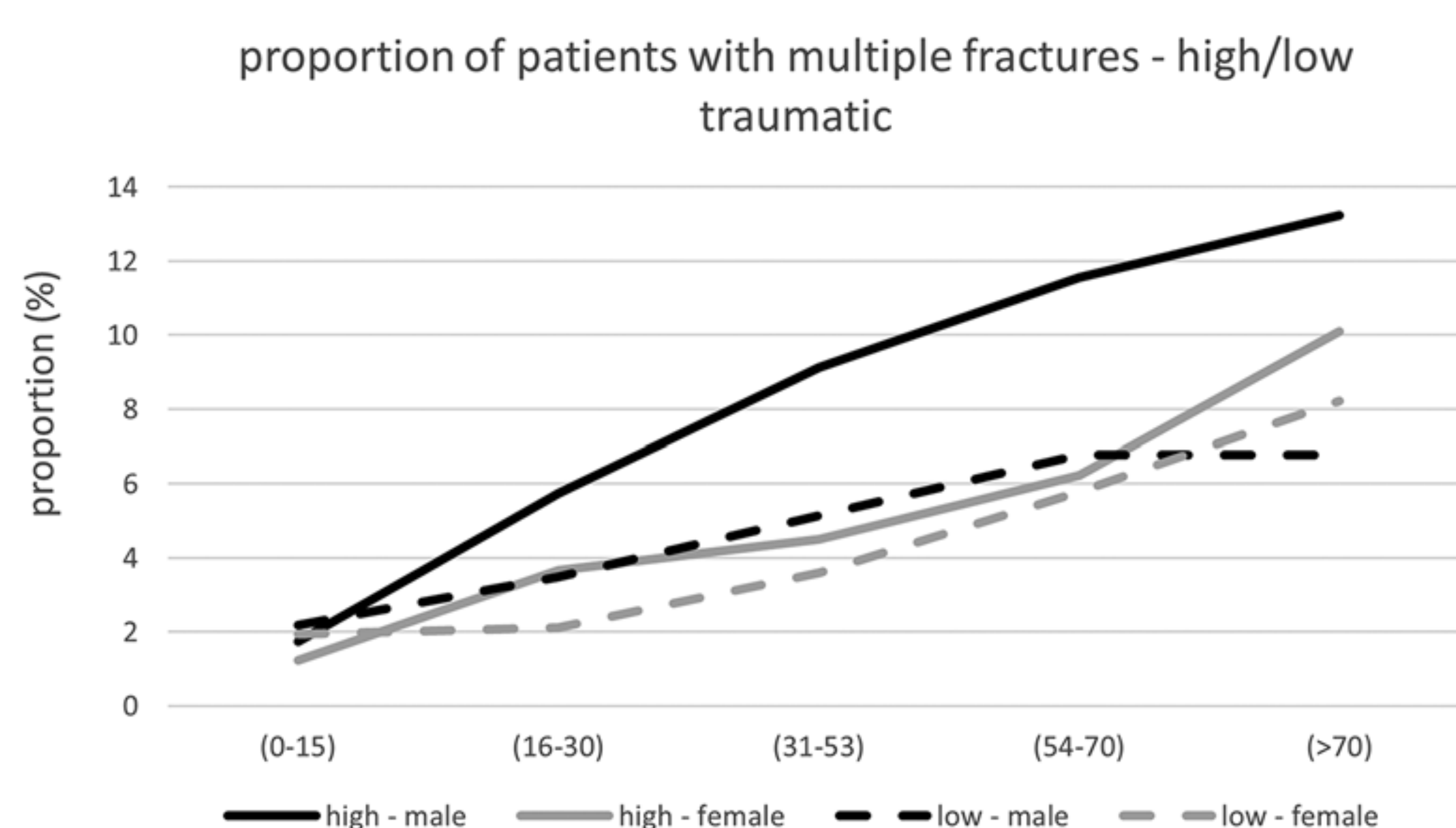
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Introduction Multiple fractures are of high clinical relevance, as a significant increase in mortality rate has been described. The purpose of this study was to evaluate differences in age and gender distribution in multiple fractures dependent on severity of trauma. Furthermore, affected anatomic regions and frequently associated fracture regions were investigated.

Methods Patients who had sustained multiple fractures between 2000 and 2012 were included in this study. At hospital admission, patients were divided according to trauma severity (high- vs low-traumatic), gender, and age for demographic analysis. Fractures were grouped in anatomical regions, and multiple fracture event probabilities as well as frequently associated regions were calculated.

Results In total, 25,043 patients at an age range of 0–100 years (5.8% of all fracture patients; 14,769 male and 10,274 female patients) who sustained 57,862 multiple fractures were included. The lumbar/thoracic spine, cervical spine, femoral shaft, skull, and pelvis showed a probability of more than 40% of the presence of further fractures in each high-traumatic fracture event. In high-traumatic fracture events, male patients were more affected ($p < 0.001$). Considering low-traumatic fractures, female patients had a significantly higher proportion ($p < 0.001$) of multiple fractures among all fractures than male patients.



Conclusions As a novelty, gender as well as age distributions in multiple fracture patients and a probability statement with the most affected anatomic regions, the risk of presence of further fractures for every region, and the frequently associated fracture regions including the percentage of occurrence are provided. These aspects yield new opportunities for clinical work and may reduce the high rate of overlooked fractures stated in the literature.

References:

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