Incidence and risk factors for prosthetic joint infection within 90 days after hemiarthroplasty for femoral neck fractures in the elderly

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BACKGROUND & IMPORTANCE
Closed femoral neck fractures after low-impact trauma in the elderly are often treated with a hemiarthroplasty. In this setting, literature with respect to prosthetic joint infection (PJI) is scarce.

AIM & OBJECTIVES
The objectives of this study were to investigate the incidence of PJI within 90 postoperative days in this population and the impact of the number of perioperative antimicrobial prophylaxis (PAP) administrations.

Furthermore, risk factors for PJI after hemiarthroplasty for femoral neck fractures in the elderly were identified.

MATERIALS & METHODS
In this retrospective monocentric study, medical files of elderly (≥75 years) trauma patients with closed femoral neck fractures and treated with a hemiarthroplasty, admitted between January 2006 and July 2017, were evaluated. Patient follow-up was 90 days. In order to identify independently associated factors for infection, a Cox proportional hazards regression analysis with forward step was applied. Results were considered statistically significant if p-values were < 0.05.

RESULTS
A consecutive series of 745 patients (mean age 85 ± 5 years, 221 (29.7%) men) was treated with a hemiarthroplasty.

Within 90 postoperative days, 13 (1.7%) patients developed a PJI and 120 (16.1%) died due to other reasons than infection.

The applied PAP regimens consisted of intravenous cefazoline or clindamycin. Single and repeated PAP administrations (≥8h) were observed. Patients who developed a PJI received a median of one (interquartile range (IQR), 1-2) PAP administration, which was not significantly different compared to the one (IQR, 1-3) PAP administration in patients that did not develop a PJI (HR=0.236 (95% CI 0.032 – 1.745) (p=0.157)).

Higher body weight (HR=1.05 (95% CI 1.008-1.094) (p=0.020)), systemic corticoid use (HR=4.790 (95% CI 1.275-17.997) (p=0.020)) and the need for transfer to the intensive care unit (ICU) for other reasons than infection (HR=8.692 (95% CI 2.353-32.106) (p=0.001)) were independently associated with the development of a PJI within 90 days (see Table 1).

Table 1: Cox proportion hazards regression analysis for PJI after fracture fixation in closed femoral neck fractures after low-impact trauma in the elderly (n = 745)

<table>
<thead>
<tr>
<th>Covariate</th>
<th>HR</th>
<th>95% CI</th>
<th>p - value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Weight, kg</td>
<td>1.050</td>
<td>1.008 – 1.094</td>
<td>0.020</td>
</tr>
<tr>
<td>Systemic corticoid use, yes</td>
<td>4.790</td>
<td>1.275 – 17.997</td>
<td>0.020</td>
</tr>
<tr>
<td>Postoperative ICU transfer, yes</td>
<td>8.692</td>
<td>2.353 – 32.106</td>
<td>0.001</td>
</tr>
</tbody>
</table>

PJI, prosthetic joint infection; n, number; HR, hazard ratio; CI, confidence interval

CONCLUSION & RELEVANCE
In this fragile trauma population, the observed 1.7% PJI incidence within 90 days is rather low compared to the incidence rate of 3.4 - 4.5% in literature1,2. Our preliminary data show that the number of PAP administrations does not influence the risk of PJI. Patients with a higher body weight, with systemic corticoid use or with postoperative ICU transfer had a higher risk of developing a PJI and should be monitored closely for infection.