

Introduction and

Background:

The often heterogeneous and unspecific symptoms of spondylodiscitis can significantly delay diagnosis and inevitable therapeutic steps resulting in increased mortality rates of up to 27%. However, prompt antibiotic therapy and, if necessary, surgical intervention have been shown to associate with an improved outcome. A rapid initial triage is therefore essential to identify patients at risk for a complicative disease course. We therefore aimed to develop a risk assessment score using readily available parameters in the emergency setting predictive of all cause in-hospital mortality in patients with spondylodiscitis.

Methods:

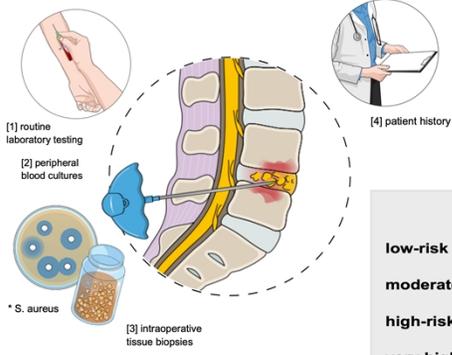
307 patients with spondylodiscitis at a tertiary center for spinal surgery recruited from 2013 - 2020 were retrospectively analyzed. Laboratory parameters, microbiological results, surgical procedures, anti-infective therapy, length of stay as well as comorbidities and mortality were recorded. Patients were grouped according to the criterion 'mortality'. Via logistic regression, individual patient and clinical characteristics predictive of mortality were identified. Interval scaled variables identified as significant were then transformed into categorical variables using Youden's J at the point of best specificity and sensitivity. The model was reassessed in a secondary logistic regression of the significant predictors, which were then weighted using a point-based system according to the β -weights and combined into a clinical score.

Results:

Overall, 14% of patients with spondylodiscitis died during their in-hospital stay. Univariate and logistic regression analyses of parameters recorded at hospital admission showed that age older than 72.5 years (2 points [p]), rheumatoid arthritis (3 p), creatinine > 1.29 mg/dL (2 p) and CRP > 140.5 mg/L (2 p) increased the risk of mortality 3.9-fold, 9.4-fold, 4.3-fold and 4.1-fold, respectively (figure 1). *S. aureus* detection increased the risk of mortality by 2.3-fold. For practical use, the score was designed with three risk categories: low (0-3 points), moderate (4-6 points) and high-risk (7-9 points). An additional point is awarded if *S. aureus* is detected.

Conclusion:

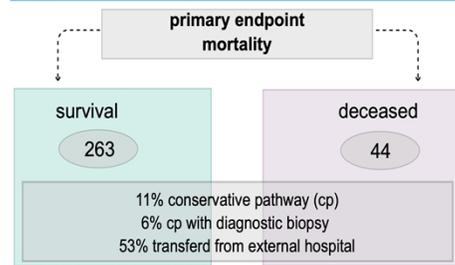
The novel Hamburg Spondylodiscitis Assessment Score (HSAS) shows a good fit identifying patients at low-, moderate-, high- and very high risk for in hospital mortality on admission (AUC: 0.795; $p < 0.001$). The implementation of the HSAS into clinical practice could ease identification of high-risk patients using readily available parameters alone, improving the patient's safety and outcome.



	points
low-risk	0
moderate-risk	1 - 3
high-risk	4 - 6
very high-risk	7 - 10

patients with spondylodiscitis 2013 - 2020

307 Ø 66 years 36% female 14% mortality



age >72,5 years	OR 3.86	2 points	* 1 additional point can be revarded if S. aureus (OR 2.27) is detected
rheumatoide arthritis	OR 9.37	3 points	
creatinine >1,29 µmol/l	OR 4.35	2 points	
CRP > 140,5 mg/dl	OR 4.07	2 points	