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O0378 Investigating the impact of early valve surgery on survival in Staphylococcus aureus infective endocarditis using a marginal structural model approach - results of a large prospectively evaluated cohort

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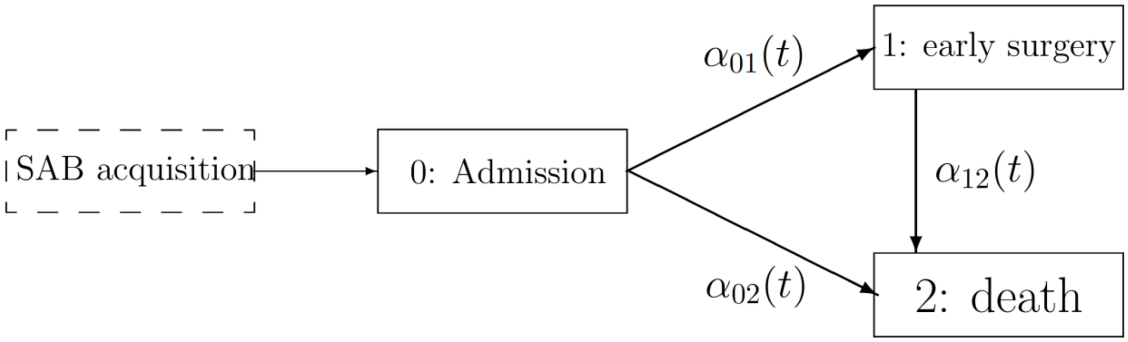
Background: Over the last decades Staphylococcus aureus has become the dominant pathogen causing infective endocarditis. The impact of early valve surgery (EVS) on outcome of S. aureus infective endocarditis (SAIE) remains controversial. Using a prospective German bicenter Staphylococcus aureus bacteremia cohort with detailed clinical, epidemiological, and management data we investigated whether early valve surgery (EVS) was associated with a better survival.

Materials/methods: EVS was defined as valve surgery (reconstruction or prosthetic valve implantation) within 60 days after detection of S. aureus in blood cultures. We used a multi-state analysis to investigate the mortality risk in association with EVS (Figure 1). A multivariable Cox regression (adjusted for age, Charlson score, and severe sepsis/septic shock and stratified by center) was performed. To address immortal time bias EVS was included as time-dependent variable. Since SAIE severity can influence mortality as well as the decision for valve surgery (i.e. treatment selection bias), we applied a marginal structural model. In this model the following time dependent confounding factors were included: i) heart failure NYHA III-IV or severe valvular insufficiency, ii) paravalvular complications (e.g. abscess) or uncontrolled infection, iii) central nervous system or other vital organ embolisation.

Results: 203 patients were included in the analysis (median age 64 years). 10% of SAIE were due to MRSA, 17% were prosthetic valve SAIE. 50 patients underwent EVS. All-cause mortality at day 30 was 27% (10% in EVS group vs. 32% in late/no valve surgery group), and 34% at day 90 (26% vs. 43% respectively). In the multivariable Cox regression model the effect of EVS on the death hazard was 0.89 (95% CI 0.5-1.59). Using the marginal structural model approach the death hazard rate of EVS was 0.77 (95% CI 0.36-1.66).

Conclusions: Upon adjustment for immortal time bias and treatment selection bias, EVS was not associated with a lower mortality in this post hoc analysis of a large cohort of prospectively evaluated SAIE patients. Therefore, EVS in SAIE should be based on individualised decisions of an experienced multidisciplinary team.

Figure 1



Multi-state analysis to analyse the mortality risk in association with early valve surgery: After S. aureus bacteremia acquisition (SAB) patients are admitted to the hospital (state 0) and are under observation until they had early valve surgery (state 1) or died without surgery (state 2). After surgery the patients remain under observation and at risk to die.