STEMI around-the-clock: how off-hours admissions impact door-to-balloon time and the long-term prognosis of ST-segment Elevation Myocardial Infarction

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Introduction: The outcomes of reperfusion in ST-segment Elevation Myocardial Infarction (STEMI) are time-dependent, and percutaneous coronary intervention (PCI) should be performed within 60 minutes from hospital admission in PCI centers – door-to-balloon time (D2B). The association between Off-Hours Admission (OHA) and long-term outcomes is controversial when considering contemporary organized STEMI networks.

Purpose: This study aims to analyze how OHA influences D2B and long-term mortality.

Methods: Retrospective study of consecutive STEMI patients (pts), admitted in a PCI-centre with a local Emergency Department, between 2010 and 2015. Pts submitted to rescue-PCI were excluded. OHA was defined as admission at night (8p.m. to 8a.m), weekends and nonworking holidays. Predictors of OHA and D2B were studied by logistic regression analysis. Demographic, clinical, angiographic and procedural variables were evaluated using stepwise Cox regression analysis to determine independent predictors of 5-year all-cause mortality (5yM). The cumulative incidence of 5yM stratified by hours of admission was calculated according to the Kaplan-Meier method.

Results: Of 901 pts, 472pts (52.4%) were admitted during off-hours. These pts were younger (61±13 vs 64±12, p=0.002) and had a lower median patient-delay time (128min vs 157min, p=0.014). Clinical severity at presentation, defined by systolic arterial pressure and Killip-Kimball (KK) class, did not differ between groups. OHA did not impact D2B (89 min vs 88 min, p=0.550), which was in turn influenced by age ≥75y (OR 1.85, 95% CI 1.31–2.61, p<0.001). Mean clinical follow-up (FUP) was 68±37 months, with 75.1% of pts achieving a FUP >5 years. 5yM rate was 9.7%. After multivariate cox regression analysis, independent determinants of long-term mortality were age (HR 1.05, 95% CI 1.02–1.08, p<0.001), previous history of heart failure (HR 6.76, 95% CI 1.32–34.72, p=0.022) and pulmonary disease (HR 3.79, 95% CI 1.16–12.33, p=0.027), presentation with KK ≥2 (HR 2.82, 95% CI 1.32–6.01, p=0.007) and radial artery access in catheterization (HR 0.39, 95% CI 0.18–0.83, p=0.014) – figure 1. Although there was an association between a higher D2B time and 5yM (87min vs 101min, p=0.024), neither OHA nor D2B were independent predictors of long-term mortality – figure 2.

Conclusion: OHA did not seem to influence D2B and long-term STEMI outcomes in our PCI-centre. 5yM was mostly influenced by patient characteristics and clinical severity at presentation.

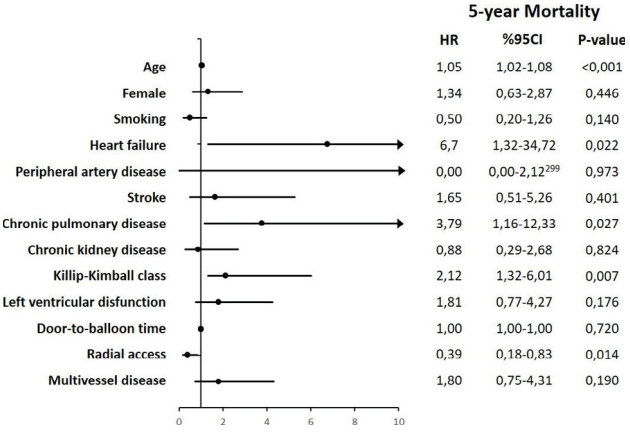

Figure 1. Predictors of long-term mortality

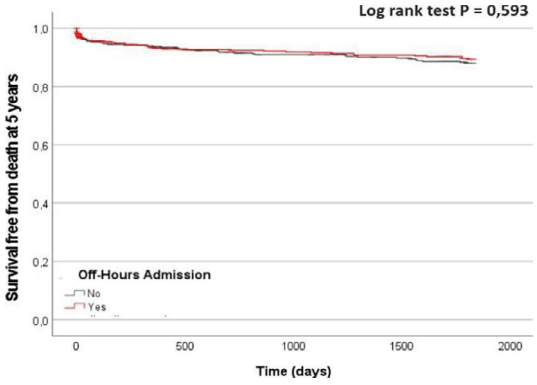

Figure 2. 5-year survival stratified by OHA