

P450 | BEDSIDE

Avoidable mortality in acute myocardial infarction at hospital level: where to look for answers?

T.M. Magalhaes¹, S.L. Lopes¹, F.S. Seixo², F.J.P. Pinto³, J.J.F.G. Gomes⁴.
¹Centro de Investigação em Saúde Pública, Escola Nacional de Saúde Pública, Universidade Nova de Lisboa, Lisbon, Portugal; ²Centro Hospitalar de Setúbal, Setúbal, Portugal; ³Serviço de Cardiologia do Centro Hospitalar de Lisboa Norte, Faculdade de Medicina, Universidade de Lisboa, Lisbon, Portugal; ⁴Centro de Matemática e Aplicações Fundamentais, Faculdade de Ciências da Universidade de Lisboa, Lisbon, Portugal

Background: Outcomes assessment is very important for improving health care outcomes and control spending. Acute myocardial infarction (AMI) was chosen for its prevalence, high morbidity and mortality, relevant mortality variability and high treatment costs.

Purpose: To study the differences between hospitals in AMI mortality and the associated waste from unjustified variation.

Methods: Patients with AMI discharged from public hospitals in our country in 2011–13 were selected and anonymized administrative data was utilized. The relevant variables to explain the differences in mortality were: patient characteristics (demographics, AMI type, comorbidities, and procedures), hospital characteristics (hospital with “coronary green way”, volume, and university hospital), and travel time to hospital. Generalized linear mixed models (1st level: patient, 2nd level: hospital) were used and specifically binary logistic regression was applied. The differences in mortality explained by each group of variables were evaluated with a percentual rate of Pseudo-r². We considered as waste the number of additional deaths in each hospital compared to patients with the same characteristics, through the hospital random effect variance (difference of each hospital to the global odds).

Results: 22.380 patients treated in 17 hospitals were included. Mortality rate was 9.5%. The mortality rate varied between 5.4% (H11) and 14.1% (H3). Our model explained 29.8% of the differences in mortality. Comorbidities explained 23.2% of mortality differences, demographic variables 7.8%, procedures 6.6%, and type of AMI 2.8%. Angioplasty and primary angioplasty procedures were protective factors, since all other procedures showed a comparatively increased risk of death, particularly fibrinolysis without angioplasty (OR 5.9; CI 3.2–10.9). Across all hospitals, there were 137 avoidable deaths, with a variation between -81 deaths (hospital with lower mortality) and +133 deaths (hospital with higher mortality). As shown in Fig. 1, there was a risk of death 3.5 times higher at H8 than at H7. The model showed excellent discrimination (area under the ROC curve: 0.871).

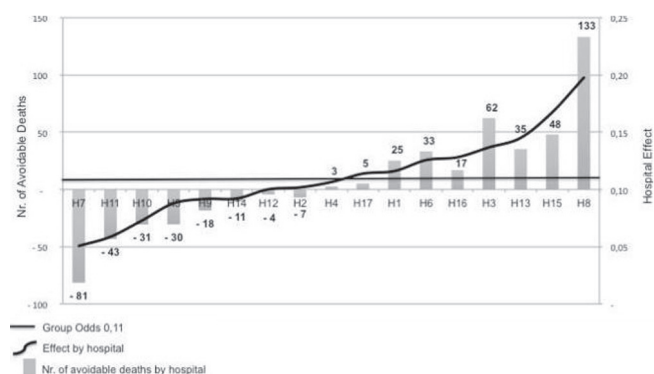


Fig 1- Hospit effect vs Avoidable deaths

Conclusion: We observed significant differences in mortality in acute myocardial infarction between hospitals, therefore indicating variability of practices. The scale of avoidable deaths justifies an investigation of its causes, mainly in the hospitals with worse performance. The hospital characteristics had little impact on the detected differences, so the inefficiencies are probably more related with the internal organization of hospitals and the way care is provided. These results raise relevant concerns at the health system and hospitals levels, in particular about the compliance with AMI guidelines.