

Impact of hospital volume on in-hospital mortality and 30-day cardiac readmission of hospitalized patients with heart failure. A population based study

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Funding Acknowledgement: Type of funding source: None

Background: Heart failure (HF) is a major health care problem. Epidemiological data from hospitalized patients are scarce and the association between hospital volume and patient outcomes is largely unknown.

Purpose: The aim of this study was to analyze the relationship between hospital volume and outcomes (in-hospital mortality and 30-day cardiac readmission).

Methods: We conducted an observational study of patients discharged with the principal diagnosis of HF from The National Health System' acute hospitals during 2015. The source of the data was the Minimum Basic Data Set of the Ministry of Health, Consumer and Social Welfare. We calculated risk-standardized mortality rates (RSMR) at the index episode and risk-standardized cardiac diseases readmissions rates (RSRR) within 30 days after discharge by using a risk adjustment multilevel logistic regression models developed by the Medicare and Medicaid Services. Information on the number of HF discharges at each hospital in 2015 was analysed to classify centres into 2 categories (high- and low-volume hospitals). To

discriminate between high- and low-volume centers, a K-means clustering algorithm was used. The association between volume and RSMR or RSRR was tested with the Pearson correlation coefficient and linear regression models.

Results: A total of 117 233 episodes of HF were selected during 2015. The mean age was 80±10 years and 46% were women. The crude in-hospital mortality rate was 12.1% and 30-day cardiac readmission rate was 18%. The cut-off point was set at 517 HF discharges per hospital during 2015. High volume hospitals had a statistically lower RSMR (10.3±2.8 vs 11.3±3.6; p<0.001) and higher RSRR (10.7±1.9 vs 9.2±1.6; p<0.001) than low volume hospitals. Low-volume hospitals showed higher dispersion of outcomes than high-volume, both for RSMR and RSRR (Figure).

Conclusions: We found that patients hospitalized for HF in 2015 had lower in-hospital mortality if they were admitted to a high-volume hospital. We have also found that high-volume hospitals had higher 30-day cardiac readmission rates.

