The impact of institutional case volume on the prognosis of ruptured aortic aneurysms: a Japanese nationwide study

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Background
To improve outcome for ruptured aortic aneurysms (rAA), centralization of treatment is potentially effective. However, there is no nationwide survey for the current managements and outcomes of rAA in Japan.

Purpose
The aim of this study was to assess the volume-outcome relationship for rAA treatment using the nationwide claim-based database.

Methods
Using the Japanese Registry Of All cardiac and vascular Diseases- Diagnostic Procedure Combination database, we identified patients admitted to 564 certified teaching-hospitals with rAA between April 1, 2012 and March 31, 2015. Institutional case volume (cardiovascular surgeries per year) was categorized into quartiles (Lowest, Low, High, and Highest) and the odds ratios (ORs) for in-hospital mortality and neurological status at discharge were analyzed for each quartile.

Results
Of 7086 eligible patients, 3925 (55.4%) died in hospital. Mortality rates decreased from 69.4% in the lowest-volume to 43.8% in the highest-volume category (P <0.001). The favourable impact of institutional case volume was sustained even after adjustment for covariates (Low-volume: OR, 0.83; 95% confidence interval [CI], 0.65–1.07; P=0.147; High-volume: OR, 0.69; 95% CI, 0.54–0.89; P=0.005; and Highest-volume: OR, 0.55; 95% CI, 0.42–0.72; P <0.001 vs. Lowest-volume). Additionally, other three institutional parameters (increased aortic surgery volume, cardiovascular surgeons’ volume, and certified cardiologists’ volume) were consistently associated with reduced in-hospital mortality. The rate of coma at discharge was the lowest in the Highest-volume group (P <0.001).

Conclusions
Increased institutional volume was associated with lower in-hospital mortality. Establishing regionally tailored systems to transfer patients to high-volume centers is needed to improve outcomes.
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