

Editorial



Does Hospital Volume of Coronary Artery Bypass Graft Matter on Mid-Term Mortality?: from the Data of National Health Insurance Service in Korea

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Cardiovascular disease is the 2nd common cause for death in Korea.¹⁾ Number of death from cardiovascular disease gradually decreased until 2009, then increased again from 2010 to 2018.¹⁾ Specifically, number of death from total heart diseases was increasing, but cerebrovascular diseases showed decreasing trend in Korea.¹⁾ And, the major cause of increasing number of death from total heart disease was heart failure, not the IHD in recent 20 years in Korea.¹⁾ Specifically, age-standardized mortality rate per 100,000 persons for IHD and MI is steadily decreasing from 2003 in men and 2006 in women until 2018, but age-standardized heart failure mortality per 100,000 person is gradually increasing in both sexes from 2003 to 2018.¹⁾ Pivotal treatment of IHD or MI is appropriate coronary revascularization including percutaneous coronary intervention (PCI) and coronary artery bypass graft (CABG). Exploiting the prognostic factors and feed-back for those in PCI or CABG is critical to improve short- and long-term fate of patients with IHD. Annual case number of PCI was 55,074 in 2015, CABG was performed in 3,086 patients older than 20 years in 2013 in Korea.²⁻⁴⁾ Even though, there are many studies to demonstrate the impact of procedural volume on the level of operator or hospital for PCI or CABG, the result is still non-conclusive. For example, according to the 2014 cohort of the Korean PCI registry, there was no significant difference of major adverse cardiovascular and cerebrovascular events between high (≥ 400 /year) and low (< 400 /year)-volume PCI hospital for the acute MI including ST-segment elevation MI (STEMI) and non-STEMI after statistical adjustment with various clinical variables including age, diabetes, prior MI, renal failure, cerebrovascular disease, STEMI presentation, cardiogenic shock, cardiac arrest, and left main or proximal left anterior descending disease.⁵⁾ According to previous articles to know the impact of procedural volume of hospital for mortality in CABG, major opinions was that larger volume of CABG in specific hospital reduced short- or long-term mortality.⁶⁾ For example, according to the analysis using US National Inpatient Sample database from 2007 to 2011, low volume center was an independent predictor of higher in-hospital all-cause mortality.⁷⁾ But, Kurlansky et al.⁸⁾ have shown that surgical volume on the level of hospital or surgeon did not have any impact on mortality or morbidity after CABG in a university-based quality improvement program, but a lack of compliance with National Quality Forum measures was highly predictive of morbidity. That meant quality of surgery and post-operative care was more important than surgery

Conflict of Interest

The author has no financial conflicts of interest.

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volume in a certain grade institution.⁸⁾ LaPar et al.,⁹⁾ showed that risk profiles of patients including presence of heart failure, renal failure, type of bypass conduit, and gender were more important than surgery volume after off-pump CABG using the Nationwide Inpatient Sample database from 2003 to 2007. With this background of ambiguity, Oh et al.¹⁰⁾ in this issue of the *Korean Circulation Journal* have revealed the impact of hospital CABG volume on 90-day mortality using claim data of the National Health Insurance Service database from 2012 to 2017 in Korea. 15,790 adult patients underwent CABG, and 1,039 (6.6%) died within 90 days after operation. They divided hospitals according to annual CABG volume into quartile (Q1: ≤ 33 , Q2: 34–86, Q3: 87–223, and Q4: ≥ 224). Q2, Q3, Q4 group hospital showed 31%, 32%, 75% lower 90-day mortality compared to Q1 group in multivariable Cox regression analysis including age, sex, residence, economic status, the Charlson comorbidity index, on/off-pump CABG, emergency CABG, hospital bed volume, number of grafts, and year of CABG. And higher ratio of the total specialist physician number to 100 hospital beds had significant relation with lower 90-day mortality after surgery. This result has important meaning that CABG volume does matter on mid-term mortality and morbidity after surgery, and also quality of care represented by specialist physician number to hospital bed volume also affects the prognosis of CABG. This finding is well-supported by various previous data dealing the impact of surgical volume to post CABG mortality and morbidity.⁶⁻⁸⁾ But, this data also has clear and important limitations and remained questions. Clinical risk profiles of enrolled patients, e.g. the Society of Thoracic Surgeons scores, creatinine clearance, left ventricular ejection fraction, precise past cardiocerebrovascular disease history was not included in analysis process, and CABG volume of each cardiothoracic surgeons in hospital also was not considered due to the fundamental limitation of data source. Therefore, caution should be taken to generalize of this data and to generate strategic decision to correct current CABG situation to improve quality. So, it is definitely necessary to initiate and maintain the well-audited, precise, nation-wide clinical registry for cardiothoracic surgery e.g. CABG, valve and aortic surgery including detailed laboratory values and clinical risk profiles of patients as soon as possible. This registry will give us more informative data including quality, appropriateness and prognostic factors for cardiothoracic surgery, and those results can be translated into the clinical and administrative strategy to improve the prognosis of cardiovascular disease patients of our nation.

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