Hospital surgical volume does not affect readmissions or resource utilization after isolated coronary artery bypass grafting (CABG) when examining socioeconomic disparities: a multistate analysis, 2007-2011

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Background:
Nationally it has been shown that there is an increase in all cause in-hospital mortality when patients are treated at surgical centers with low CABG surgical volume [1]. Patients undergoing CABG from low socioeconomic status (SES) areas when compared to those from higher SES areas, were found to have higher mortality at high-surgical volume hospitals [2]. Associations between African American race and Medicare or Medicaid and higher 30-day readmission rates post-CABG have been found [3]. However, few studies have identified potential racial and payer-based disparities of outcomes after CABG in regards to readmissions, length of stay (LOS), and hospital charges when stratified by hospital surgical volume.

Methods:
A retrospective review for isolated CABG patients >18 years from 2007 to 2011 was performed using the State Inpatient Databases of California, Florida, and New York, Healthcare Cost and Utilization Project, Agency for Healthcare Research and Quality. Bivariate analysis was performed based on primary insurance payer-type. Multivariate regression for 30-day readmissions, LOS, and hospital charges were calculated to obtain odds ratios (OR) for outcomes by insurance type and race; these models were re-run with statistical stratification by hospital surgical volume in quartiles.

Results:
194,912 patients who underwent isolated CABG were included in our analysis. For risk-adjusted 30-day readmission, patients with Medicaid had a higher risk of readmission compared to those with private insurance across all hospital surgical volumes, most pronounced for the lowest quartile (OR 1.68, 95% CI 1.53-1.85). For all hospital surgical volumes, patients with Medicaid had a higher risk of an increased LOS compared to patients with private insurance, most pronounced for the lowest quartile (OR 1.24, 95% CI 1.22-1.26). Patients with Medicaid had a higher risk of increased hospital charges for the three largest quartiles by hospital surgical volume when compared to patients with private insurance, most pronounced for Quartile 2 (OR 1.14, 95% CI 1.12-1.16) and Quartile 4 (OR 1.14, 95% CI 1.11-1.16). With respect to race, Black and Hispanic patients had a higher risk of an increased LOS compared to White patients across all hospital surgical volumes (except Quartile 3 for Hispanics). Compared to White patients, Black and Hispanic
patients had a higher risk of 30-day readmission and increased total hospital charges across all hospital surgical volumes; this effect was most pronounced for Quartile 4 with 30-day readmission (Black: OR 1.31; Hispanic: OR 1.31) and hospital charges (Black: OR 1.18; Hispanic: OR 1.16).

Conclusions:

CABG patients with Medicaid and those who are Black and Hispanic are more likely to have longer LOS, have higher hospital charges, and have a higher risk of 30-day readmissions compared to patients with private insurance and those who are White. The effects of Medicaid were primarily evident for the smallest hospital surgical volumes whereas the effects of race were primarily evident for the largest. Our results indicate that disparities in both insurance type and race with respect to 30-day readmissions, LOS, and hospital charges are largely consistent across isolated CABG hospital surgical volumes. 

References

