CORRESPONDENCE

Behavioral Heuristics in Coronary-Artery Bypass Graft Surgery

TO THE EDITOR: Behavioral heuristics (mental shortcuts that simplify decision making) are common in medicine and can lead to cognitive biases that affect clinical decisions.[1] Left-digit bias is the tendency to categorize continuous variables on the basis of the left-most numeric digit.[2] Left-digit bias explains why items are often priced at $4.99 as opposed to $5.00. This bias may affect treatment decisions. For example, patients who are hospitalized with acute myocardial infarction and who are 80 years and 2 weeks of age may be perceived by physicians as being at greater risk for complications — and thus may receive more conservative treatment — than patients who are 79 years and 50 weeks of age, if cognitive biases lead physicians to discretely categorize patients as being "in their 80s" rather than "in their 70s."

We used data on Medicare beneficiaries from 2006 through 2012 to evaluate how frequently inpatient coronary-artery bypass grafting (CABG) was performed in patients who were admitted with acute myocardial infarction in the 2 weeks before their 80th birthday as compared with those who were admitted in the 2 weeks after their 80th birthday. We hypothesized that CABG would be performed less frequently among patients admitted after their 80th birthday, despite an absence of recommendations in clinical guidelines to reduce CABG use at this age.[3] We focused on CABG because of its complexity and because surgical revascularization may improve long-term survival, albeit at the expense of short-term complications and a long recovery period, a tradeoff that may lead physicians to treat those patients they perceive to be at greater risk for complications more conservatively.[4] Mortality between the groups was also compared up to 1 year after hospitalization. Additional methods and results are provided in the Supplementary Appendix, available with the full text of this letter at NEJM.org.

Patients with acute myocardial infarction who were admitted in the 2 weeks after their 80th birthday were similar to those admitted before their 80th birthday with regard to various baseline characteristics (Table S1 in the Supplementary Appendix). However, those admitted after their 80th birthday were significantly less likely to undergo CABG than those admitted before their 80th birthday (5.3% [265 of 5036 patients] vs. 7.0% [308 of 4426 patients]; risk difference, –1.7 percentage points; 95% confidence interval [CI], –2.7 to –0.7; P<0.001), with no corresponding difference among patients who were admitted in the 2 weeks after as compared with 2 weeks before their 77th through 79th or 81st through 83rd birthdays. Findings were unaffected by adjustment for covariates (Fig. 1A). The adjusted

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30-day mortality after hospitalization for acute myocardial infarction was 17.7% among patients admitted before their 80th birthday and 19.8% among those admitted after their 80th birthday (adjusted difference, 2.1 percentage points; 95% CI, 0.5 to 3.7) (Fig. 1B). Although we cannot completely rule out the possible influence of confounding factors, these results are consistent with the occurrence of left-digit bias in clinical decision-making, as a previous study has also shown.[5]

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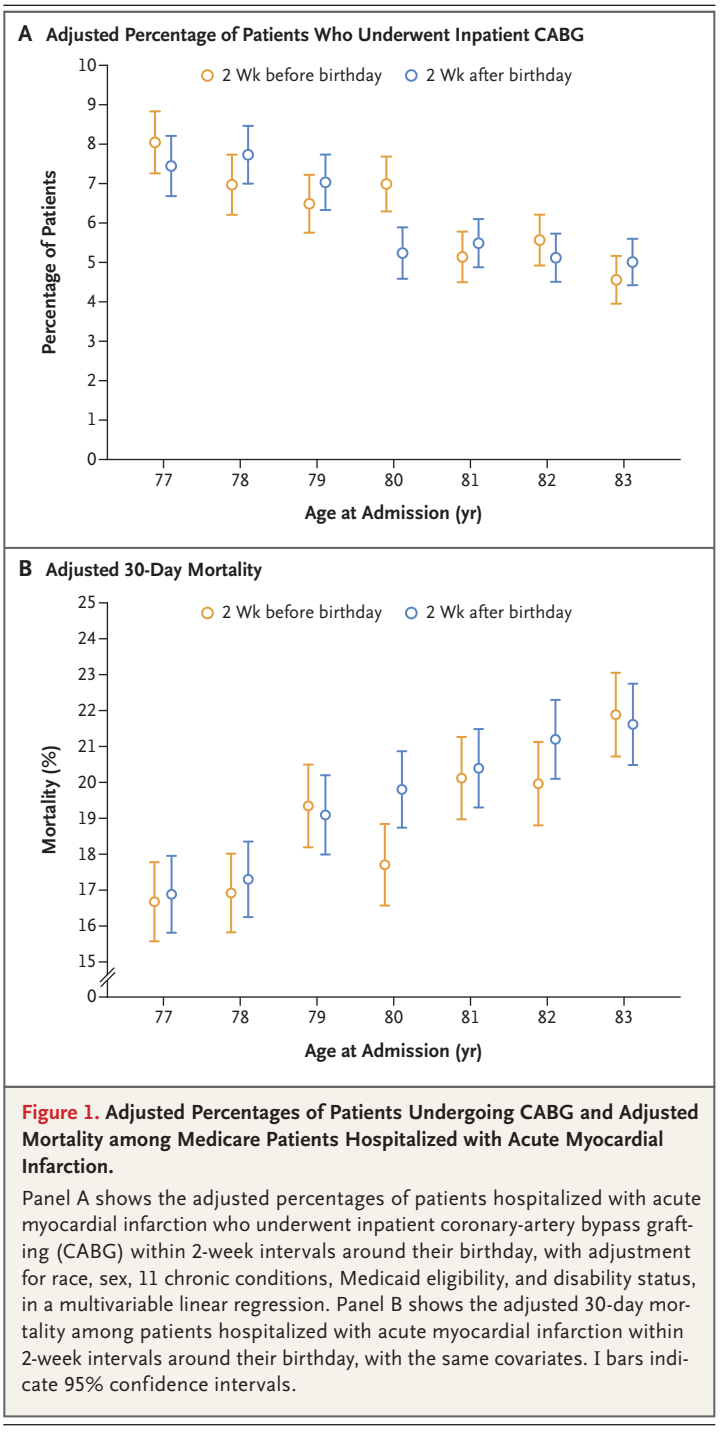

Figure 1. Adjusted Percentages of Patients Undergoing CABG and Adjusted Mortality among Medicare Patients Hospitalized with Acute Myocardial Infarction.

Panel A shows the adjusted percentages of patients hospitalized with acute myocardial infarction who underwent inpatient coronary-artery bypass grafting (CABG) within 2-week intervals around their birthday, with adjustment for race, sex, 11 chronic conditions, Medicaid eligibility, and disability status, in a multivariable linear regression. Panel B shows the adjusted 30-day mortality among patients hospitalized with acute myocardial infarction within 2-week intervals around their birthday, with the same covariates. I bars indicate 95% confidence intervals.

Nintedanib in Progressive Fibrosing Interstitial Lung Diseases

TO THE EDITOR: In the INBUILD trial (Oct. 31 issue),[1] the investigators and the editorialist[2] consider a heterogeneous group of patients with progressive fibrosing interstitial lung disease as a single entity. However, the cause of disease, prognosis, and trajectories for survival differ de-