Medical Xpress

Proportion of patients with diabetes undergoing CABG spikes five-fold over four decades

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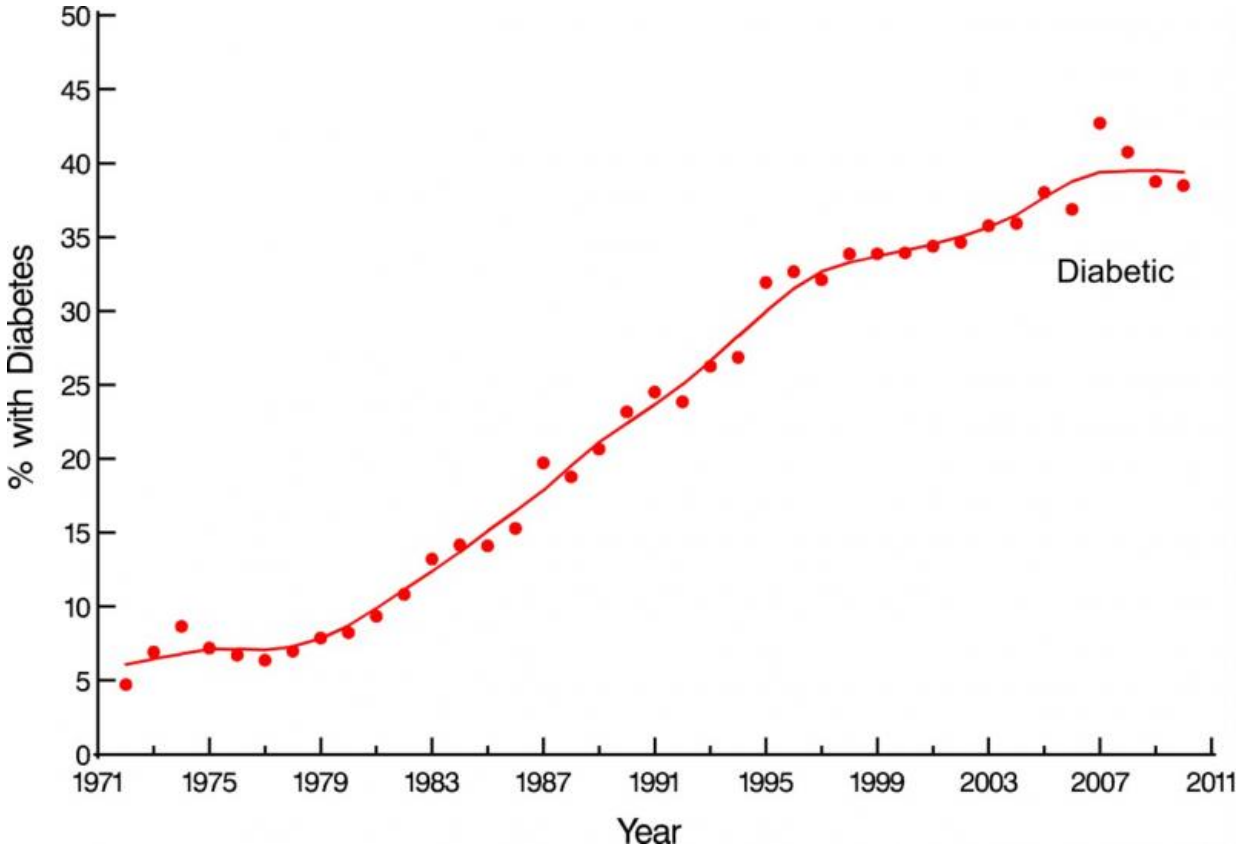

Four-decade trend in prevalence of diabetes among patients undergoing primary isolated coronary artery bypass grafting. Each circle represents a yearly percentage, and the solid line is the locally estimated scatterplot smoother (loess) estimate ('Coronary artery bypass grafting in diabetics: A growing health care cost crisis' by Sajjad Raza et al). Credit: *Journal of Thoracic and Cardiovascular Surgery*

In the 40 years between 1970-2010, the proportion of patients with diabetes undergoing coronary artery bypass grafting (CABG) escalated from 7% to 37%. The results of a large study from Cleveland Clinic just published in *The Journal of Thoracic and Cardiovascular Surgery*, the official publication of the American Association for Thoracic Surgery (AATS), documents the five-fold increase in the proportion of patients with diabetes undergoing this procedure between 1970 and 2010. These patients have more postoperative complications and decreased long-term survival than those without diabetes, and represent a growing challenge to reining in healthcare costs.

"Diabetes is both a marker for high-risk, resource-intensive, and expensive care after CABG, and an independent risk factor for reduced long-term survival," explained lead investigator Joseph F. Sabik III, MD, Chairman of Thoracic and Cardiovascular Surgery and Director of the Cardiothoracic Residency Training Program at the Sydell and Arnold Miller Heart & Vascular Institute, Cleveland Clinic (Cleveland, OH). In response, surgeons are issuing a call-to-action to implement steps to minimize operative risks and improve outcomes for the escalating proportion of patients with diabetes who are undergoing surgery for coronary artery disease.

While endocrinologists may be the physicians bearing the greatest responsibility for managing patients with diabetes, diabetes is also having a tremendous impact on surgery, as shown in this analysis of a robust and well-maintained registry of more than 57,000 patients who underwent CABG at Cleveland Clinic between 1970 and 2010. The registry included 10,362 patients with diabetes and 45,139 patients without the disease.

The study showed that diabetics undergoing CABG had worse outcomes,

with more in-hospital deaths (2.0% vs. 1.3%), deep sternal wound infections (2.3% vs. 1.2%), strokes (2.2% vs. 1.4%), renal failure (4.0% vs. 1.3%), and prolonged postoperative hospital stays (9.6% vs. 6.0%), compared to nondiabetic patients.

Survival after CABG among patients with diabetes was worse at 1, 5, 10, and 20 years. For example, survival after 20 years was 18% for patients with diabetes compared with 42% for those without the disease.

The study also compared outcomes of CABG patients with diabetes to CABG patients without diabetes who were propensity matched as having similar levels of risk for complications. In these comparisons, individuals with diabetes still experienced more deep sternal wound infections and strokes and had worse late survival.

Total costs were 9% higher in patients with diabetes who underwent CABG, driven mainly by clinical and laboratory tests, imaging studies, medicines, nursing costs, and longer ICU and postoperative stays. "Clearly, policies and programs focused on controlling the factors that promote diabetes are critical to improving global public health and reining in the rising cost of healthcare," stated Dr. Sabik.

The study provided valuable insights about ways to improve surgical outcomes for patients with diabetes, such as the choice of whether to use unilateral or bilateral internal thoracic artery (ITA) grafts. "Despite compelling evidence of survival benefit of bilateral internal thoracic arteries from the authors' own institution, the use of bilateral thoracic arteries remains distressingly low," commented Mani Arsalan, MD, and Michael Mack, MD, of the Baylor Research Institute (Dallas, TX) in an editorial. In the registry, only 18% (11% of nondiabetic patients and 7.5% of diabetic patients) received bilateral ITA grafts. They suggest using both ITAs in those patients who are not at inordinate risk and stand most to benefit, such as those who are young and nonobese with a

greater than 10-year life expectancy.

The Cleveland Clinic results also indicated that worse long-term survival after CABG in diabetic patients was more likely due to their greater comorbidity burden than the ineffectiveness of CABG, according to Dr. Sabik. Because the use of bilateral ITA grafts is associated with more complications, including sternal wound infection, the method of choice for an elderly, morbidly obese woman with high atherosclerotic burden and low life expectancy might be to use a single ITA graft.

"Bypass grafting is clearly superior to interventional approaches for the diabetic patient," added Paul Kurlansky, MD, Assistant Professor, Department of Surgery at Columbia University Medical Center (New York). "The Cleveland Clinic Study provides many important historical, clinical, and social insights. Their careful data analysis seems to have teased out the associated comorbidities from the mere fact of diabetes itself, to suggest that the incremental impact of diabetes, independent of associated risk factors, is not discernable in the early postoperative period, but rather takes an increasing toll on late mortality." He also noted that diabetes is likely to remain a surgical concern for the foreseeable future.

Another step surgeons can take is to postpone elective procedures until patients with diabetes have achieved better blood sugar levels and glycemic control. "The weight may be increasingly on our patients, but the real weight is on us as surgeons to help improve their early- and long-term survival," wrote Dr. Arsalan and Dr. Mack.

More information: "Coronary artery bypass grafting in diabetics: A growing health care cost crisis," by Sajjad Raza, MD, Joseph F. Sabik III, MD, Ponnuthurai Ainkaran, MS, and Eugene H. Blackstone, MD. DOI: dx.doi.org/10.1016/j.jtcvs.2015.03.041

"Coronary artery bypass grafting in patients with diabetes: The weight is on us," by Mani Arsalan, MD, and Michael Mack, MD. DOI: dx.doi.org/10.1016/j.jtcvs.2015.05.046

"Diabetes: To graft or not to graft is no longer the question," by Paul Kurlansky, MD. DOI: dx.doi.org/10.1016/j.jtcvs.2015.05.051

"The Diabetes Epidemic and Its Effect on Cardiac Surgery Practice," by Sajjad Raza, MD, Eugene H. Blackstone, MD, Joseph F. Sabik III, MD. DOI: dx.doi.org/10.1016/j.jtcvs.2015.07.037

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