

Reasons for hospital-level variations in bleeding post-angioplasty are unclear

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The use of bleeding avoidance strategies has only a modest effect on the variation in bleeding rates post-angioplasty among hospitals performing this procedure, leaving about 70 percent of the causes for this variation unexplained, according to a study published today in *JACC: Cardiovascular Interventions*.

The study also examined whether patients treated with bleeding avoidance strategies were those at low risk for this complication, not high-risk patients who potentially would benefit more. This a risk-treatment paradox—when patients who need an intervention the most receive it the least frequently—has been demonstrated in previous studies.

Using data from the American College of Cardiology NCDR CathPCI Registry, researchers examined records from almost 2.5 million procedures at 1,358 sites between 2009 and 2013. In conducting their analysis, researchers adjusted for patient risk, considering such variables as gender, age, [body mass index](#), the presence of cerebrovascular disease, prior angioplasty and diabetes. They also looked at whether combinations of bleeding avoidance strategies—use of the radial artery for access during angioplasty, administering the blood thinner bivalirudin, and sealing off the point of access with a vascular closure device—had an impact on bleeding totals.

Throughout the study period, researchers observed 125,361 bleeding events. Patients who had the procedure done with radial access had less

bleeding than those who did not: 5 percent vs. 11.2 percent. Bivalirudin therapy was used less frequently among patients who experienced bleeding: 43.8 percent vs. 59.4 percent—and vascular closure devices were used at lower rates: 32.9 percent vs. 42.4 percent.

Consistent with previous research, the study also demonstrated the risk-treatment paradox. Patients receiving bleeding avoidance strategies had a predicted bleeding risk of 3.2 percent, compared with a predicted bleeding risk of 4.5 percent among those not receiving these strategies.

Overall, researchers found that the median hospital rate of use of any bleeding avoidance strategy was 86.6 percent. Increased use of these strategies was associated with decreased probability of an individual bleeding event.

The study also showed a significant variation in bleeding rates among hospitals, just as previous studies had found. After incorporating individual patient risk for bleeding, hospital rates for bleeding varied from 2.6 percent to 9.3 percent. With bleeding avoidance strategies having only a small effect on overall hospital-level variation, about 70 percent of the variation among hospitals remains unexplained.

Amit N. Vora, M.D., M.P.H., the study's lead author and a cardiologist with the Duke Research Institute in Durham, North Carolina, said that "these findings have several implications for both clinical care and quality improvement." He said that when hospitals used bleeding [avoidance strategies](#) in more than 85 percent of patients, bleeding rates were lower, "demonstrating that an approach to broaden the use of these strategies in all [patients](#)—overcoming the 'risk-treatment paradox'—may be a reasonable way to reduce overall variation in hospital bleeding rates."

Vora also addressed limitations associated with using post-procedure

bleeding as a performance measure for hospitals. Because almost 70 percent of bleeding rates remain unexplained, "the stringent use of bleeding rate measures to determine reimbursement rates or to penalize institutions by payers and regulators may be premature at this time," he said.

According to Vora, the next best step is to perform "further analyses to determine the causes of variation in bleeding following angioplasty among hospitals, including the use of vascular ultrasound during the procedure when using the femoral artery as the access point, along with using protocols to stop [bleeding](#)."

More information: *JACC: Cardiovascular Interventions*, [dx.doi.org/10.1016/j.jcin.2016.01.033](https://doi.org/10.1016/j.jcin.2016.01.033)

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