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RADIATION EXPOSURE DURING TRANSCATHETER AORTIC VALVE IMPLANTATION (TAVI) PROCEDURES

ACC Poster Contributions

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Background: Transcatheter aortic valve implantation (TAVI) is a new alternative treatment for patients with severe aortic stenosis (AS) who are at “high risk” for conventional surgical aortic valve replacement. TAVI typically uses cine-fluoroscopic guidance and adjunctive trans-esophageal echocardiography for valve assessments and angiographic imaging for access site management. Currently, the range of radiation doses utilized during TAVI procedures is unknown.

Methods: Data on radiation exposure were prospectively collected and entered in a database for consecutive patients undergoing TAVI at our center; radiation doses were available in 105 patients. Radiation dose during the procedure was recorded using the FDA reference point (Ka,r) and the dose area product (PKR). In addition to quantifying overall radiation doses during TAVI, we compared the radiation doses for different access approaches; trans-femoral (TF) in 77 patients) and trans-apical (TA) in 28 patients).

Results: The median radiation dose during TAVI was 1639 mGy (983-2420), or 186 (107-326) Gy*cm². Radiation dose was not significantly different among TA and TF patients using either the reference point [TA: 1271 (871-2159) vs. TF: 1766 (1080-2470) mGy; p=0.096] or the dose area product [TA: 147 (80-313) vs. TF: 203 (115-330) Gy*cm²; p=0.134]. Fluoroscopy time was also similar for TA and TF patients [TA: 24 (9-34) vs. TF: 27 (18-33) minutes; p=0.150]. Three patients (all TF) had radiation doses above 5 Gy; two had procedure-related complications (one transcatheter heart valve embolization and one vascular perforation treated with a covered stent), and the other patient was morbidly obese.

Conclusions: The radiation exposure during TAVI appears similar to other percutaneous coronary interventions of moderate complexity. Radiation doses were numerically higher but not significantly different for TF compared with TA procedures. The slightly higher dose of radiation in TF patients may be related to additional imaging requirements to optimize percutaneous vascular access and closure.