Radiographic and Clinical Brain Infarcts in Cardiac and Diagnostic Procedures: A Systematic Review and Meta-Analysis.

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Abstract

BACKGROUND AND PURPOSE:
The incidence of periprocedural brain infarcts varies among cardiovascular procedures. In a systematic review, we compared the ratio of radiographic brain infarcts (RBI) to strokes and transient ischemic attacks across cardiac and vascular procedures.

METHODS:
We searched MEDLINE and 5 other databases for brain infarcts in aortic valve replacement, coronary artery bypass grafting, cardiac catheterization, and cerebral angiogram through September 2015. We followed the PRISMA (preferred reporting items for systematic reviews and meta-analyses) recommendations. We defined symptomatic rate ratio (RR) as ratio of stroke plus transient ischemic attack rate to RBI rate.

RESULTS:
Twenty-nine studies involving 2124 subjects met the inclusion criteria. In meta-analysis of aortic valve replacements with 494 people, 69.4% (95% confidence interval (CI), 57.6%-81.4%) had RBIs, whereas 3.6% (95% CI, 2.0%-5.2%) had clinical events (RR, 0.08; 95% CI, 0.05-0.12). Coronary artery bypass grafting among 204 patients had 27.4% (95% CI, 6.0%-48.8%) RBIs and 2.4% (95% CI, 0.3%-4.5%) clinical events (RR, 0.11; 95% CI, 0.05-0.26). Cardiac catheterization among 833 people had 8.0% (95% CI, 4.1%-12.0%) RBIs, and 0.6% (95% CI, 0.1%-1.1%) had clinical events (RR, 0.16; 95% CI, 0.08-0.31). Cerebral angiogram among 593 people had 12.8% (95% CI, 6.6-19.0) RBIs and 0.6% (95% CI, 0%-13%) clinical events (RR,
0.10; 95% CI, 0.04-0.27). The RR of all procedures was 0.10 (95% CI, 0.07-0.13) without differences in the RRs across procedures ($P=0.29$).

**CONCLUSIONS:**
One of 10 people with periprocedural RBIs during cardiac surgeries and invasive vascular diagnostic procedures resulted in strokes or transient ischemic attacks, which may serve as a potential surrogate marker of procedural proficiency and perhaps as a predictor of risk for periprocedural strokes.

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**KEYWORDS:**
aortic valve replacement; brain; cardiac catheterization; coronary artery bypass; stroke

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