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On the Independence Assumption in Meta-Analyses of Registry-Derived TCAR and TFCAS Outcomes



To the Editor:

We read with interest the recent meta-analysis by Hassan et al.,¹ “Comparative Safety and Efficacy of Transcarotid Artery Revascularization versus Transfemoral Carotid Artery Stenting: A Systematic Review and Meta-Analysis.” The article addresses a clinically relevant and timely topic, and the reported findings align with outcomes described previously in single-institutional and registry-based studies.

We would like to offer a methodological consideration that may be relevant when interpreting the pooled estimates. Several of the included studies appear to draw on data from components of the Society for Vascular Surgery’s Vascular Quality Initiative (VQI), including the transcarotid artery revascularization Surveillance Project, the Carotid Stent Registry, and the Medicare-linked VISION cohort.^{2–4} As these analyses may examine overlapping patient populations across similar time periods, there is the possibility that some patients could be represented more than once within the pooled dataset. The remaining nonregistry transcervical studies consist of a small single-center cohort published in 2016 and an earlier series from 2005 predating contemporary transcarotid artery revascularization technology, together contributing a relatively small number of patients compared with the overall pooled sample. Consequently, the quantitative findings of the meta-analysis may be influenced primarily by repeated analyses of the same underlying registry population rather than by fully independent datasets.

The fundamental value of a meta-analysis lies in its ability to expand understanding by integrating evidence from independent sources. Recent work by Lock and El Ansari has demonstrated that unrecognized registry duplication can materially alter pooled quantitative estimates.⁵ When overlapping registry-based analyses are treated as independent, repeated inclusion of the same underlying patient population may inflate the nominal sample size and create a misleading appearance of statistical precision, thereby limiting the interpretive strength of the pooled analysis. Given that 11 of the 13 included studies are

from the VQI with overlapping accrual periods and similar inclusion criteria, can the authors estimate the potential magnitude of overlap and its impact on dataset independence? In this context, how should readers understand the added evidentiary value of the pooled analysis?

CREDIT AUTHORSHIP CONTRIBUTION STATEMENT

Pooria Nakhaei: Writing – review & editing, Writing – original draft, Conceptualization. **Mahmoud Malas:** Writing – review & editing, Supervision, Conceptualization.

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