Comparative Effectiveness of Open Versus Minimally Invasive Transforaminal Lumbar Interbody Fusion: An Umbrella Review of Meta-Analyses

Jagtiani, Pemla; Karabacak, Mert; Margetis, Konstantinos

Clinical Spine Surgery. 37(6):E225-E238, July 2024.

Abstract

Study Design:

Umbrella review of meta-analyses.

Objective:

To compile existing meta-analyses to provide analysis of the multiple postoperative outcomes in a comparison of open-transforaminal lumbar interbody fusions (O-TLIFs) versus minimally invasive transforaminal interbody fusions (MI-TLIFs).

Summary of Background Data:

TLIF is the standard surgical intervention for spinal fusion in degenerative spinal diseases. The comparative effectiveness of MI-TLIFs and O-TLIFs remains controversial.

Methods:

A literature search was conducted in the PubMed, Scopus, and Web of Science databases. Titles and abstracts were initially screened, followed by a full-text review based on the inclusion criteria. Twenty articles were deemed eligible for the umbrella review. Data extraction and quality assessment using A Measurement Tool to Assess Systematic Reviews were performed. Effect sizes of the outcomes of interest from primary studies included in the meta-analyses were repooled. Repooling and stratification of the credibility of the evidence were performed using the R package *metaumbrella*. The pooled effect sizes were compared and interpreted using equivalent Hedges' *g* values.

Results:

When the meta-analyses were pooled, MI-TLIF was found to have a shorter length of stay, less blood loss, and a higher radiation exposure time, with a highly suggestive level of evidence. Data regarding less postoperative drainage, infections, and Oswestry disability

index for MI-TLIF were supported by weak evidence. Conversely, data regarding other postoperative outcomes were nonsignificant to draw any conclusions.

Conclusion:

Our umbrella review provides a comprehensive overview of the relevant strengths and weaknesses of each surgical technique. This overview revealed that MI-TLIF had better outcomes in terms of length of stay, blood loss, postoperative drainage, infections, and Oswestry disability index when compared with those of O-TLIF. However, O-TLIF had a better outcome for radiation exposure when compared with MI-TLIF.