Interspinous Process Device versus Surgical Decompression for Lumbar Stenosis: A Systematic Review and Meta-analysis

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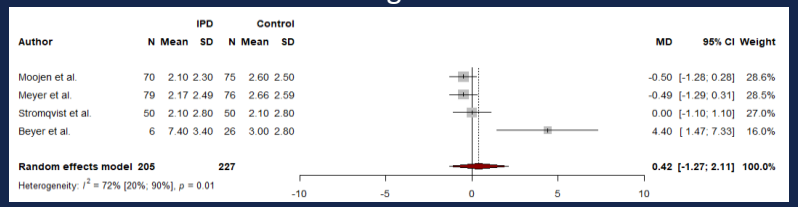
Background

Interspinous process device (IPD) implantation represents a relatively less invasive and contemporary surgical technique to manage lumbar spinal stenosis (LSS) which remains a prevalent condition presenting with back pain and intermittent neurogenic claudication. This meta-analysis includes prospective double-arm trials that determine the efficacy of IPD over surgical decompression in the management of LSS.

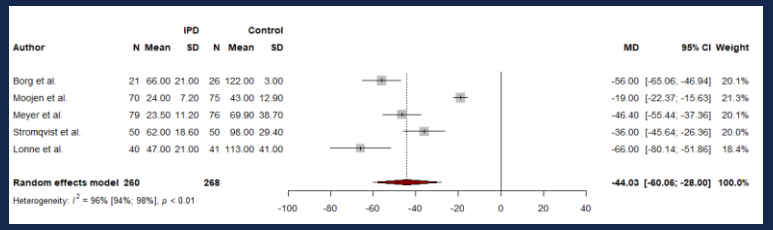
Methods

Using PRISMA guidelines, we searched Cochrane Central Register of Controlled Trials, the Cochrane Database of Systematic Reviews, Embase, Medline, and Scopus for articles published between April 1983 to July 2022. All records were screened according to a predefined search strategy, inclusion, and exclusion criteria. The data was extracted, and disagreements were resolved. The outcomes of interest were commonly used patient-reported outcomes, which included the Visual Analog Scale (VAS) scores for back and leg pain, mean operative time, mean hospital stay, complications, and reoperations. Forest plots were generated to report associations as well as funnel plots to report the risk of publication bias.

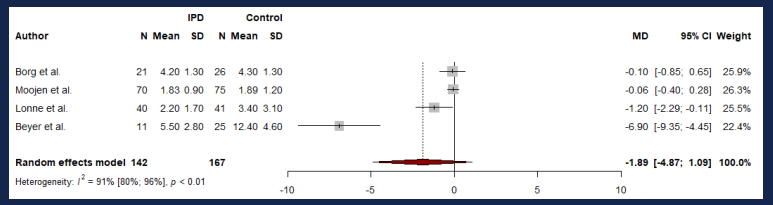
VAS Leg Pain



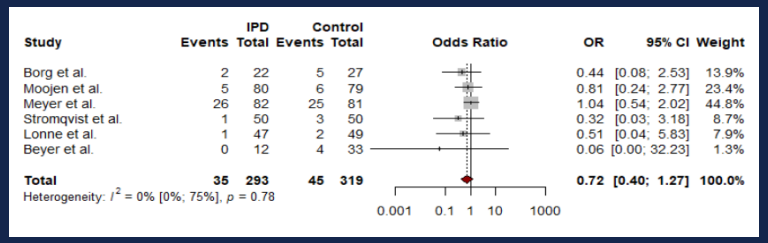
Mean Operative time



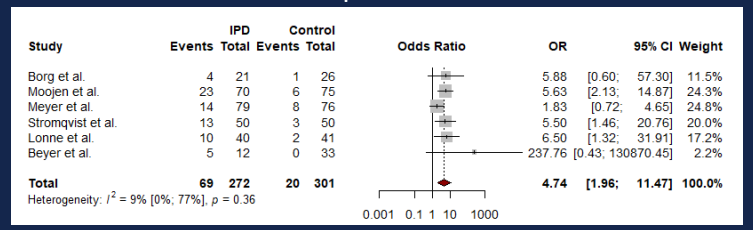
Mean Hospital Stay



Postoperative Complications



Reoperations



Results

The meta-analysis included 612 patients from six eligible studies, comprising five randomized and one non-randomized controlled trials. A total of 293 patients received IPD whereas 319 underwent surgical decompression, serving as the control group. The IPD group had significantly lower operative time (mean difference = -44.03; 95% CI: [-60.06, -28.00]) than the decompression group. However, the IPD group had a significantly higher rate of reoperations (OR: 4.74; 95% CI: [1.96, 11.47]) than the decompression group. No significant differences were observed between the two groups in terms of VAS scores, mean hospital stay, and complication rates.

Conclusion

The study demonstrates the superiority of IPD in terms of operative time but at a higher risk of reoperations. Further studies are required to weigh the benefits and risks of the less-invasive IPD placement against surgical decompression for long term management of LSS.

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