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Letter to the Editor

A commentary on "Effect of Parkinson's disease on primary total joint arthroplasty outcomes: A meta-analysis of matched control studies" (Int J Surg 2019, Epub ahead of print)

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Dear Editor,

We read with great interest the article by Min et al. [1] entitled "Effect of Parkinson's disease on primary total joint arthroplasty outcomes: A meta-analysis of matched control studies" published online, 26 September 2019, in the *International Journal of Surgery*. These authors performed a systemic review and meta-analysis to ascertain if Parkinson's Disease (PD) increases the risks of complication and revision rates after total joint arthroplasty (TJA). They concluded that patients with PD are at increased risks of medical and surgery complications, increased length of stay (LOS) and total hospital charges. We appreciate that Min and colleagues have spent efforts on such an interesting topic. However, some details are worth mentioning to improve this article.

First, as the primary outcome is most important in clinical decision making, and any conclusions drawn on the effects of the interventions are based largely on outcomes, there should in general be no more than three primary outcomes [2]. The authors, in addition to selecting the incidence of complications as the primary outcome, reported five more outcomes: medical complication, infection, dislocation, DVT, and revision. Excessive use of primary outcomes is not conducive to clinical decision making. Furthermore, the authors failed to mention surgical complication in the Method, but reported it in the Results Section (**3.3.2**). The authors also did not clearly define what was medical complication, making the article very confusing to read. For example, there is no doubt that infection is a medical complication. For the five studies (Tinning et al., 2013, Wong et al., 2018, Rondon et al., 2018, Shah et al., 2019, Jämsen et al., 2014) which reported infection, four studies (Tinning et al., 2013, Wong et al., 2018, Newman et al., 2018, Shah et al., 2019) reported it as a medical complication. In our opinion, infection should be pooled as a medical complication.

Second, sensitivity analysis is a method to evaluate whether the results of meta-analyses are stable and reliable [2]. Actually, sensitivity analysis is suggested to be performed no matter how high the heterogeneity is. Although the authors stated: "Among the outcomes with high heterogeneity, the sensitivity analysis showed that excluding any one single study did not change the statistical results." We repeated the sensitivity analyses. However, significant changes of statistical results were observed by excluding the study by Newman et al., 2018 in **Fig 2A**, the study by Jämsen et al., 2014 in **Fig 2B**, and the study by Newman et al., 2018 in **Fig 3C**.

Third, it is considered to be heterogeneous between studies when $I^2 > 40\%$ [2], and significantly heterogeneous when $P_{\text{heterogeneity}} \leq 0.10$ [3]. If heterogeneity was not observed on statistical studies and when $P_{\text{heterogeneity}} > 0.10$, the fixed-effects Mantel–Haenszel model is suggested to be employed [4]. Nevertheless, the author of this article stated that all the outcomes were pooled using the random-effects model [5]. Paradoxically, a fixed-effects model was used in **Fig 3C**. In fact, reanalyzing the data using different statistical methods (such as replacing the fixed-effects model with a random-effects model and vice versa) is essentially carrying out a sensitivity analysis.

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Declaration of competing interest

None of the authors has financial or other conflicts of interest concerning this study.

References

[1] H. Min, H. Lin, G. Chen, Effect of Parkinson's disease on primary total joint arthroplasty outcomes: a meta-analysis of matched control studies, Int. J. Surg. 71 (2019) 124–131.
[2] J. Higgins, S. Green, Cochrane Handbook for Systematic Reviews of Interventions, Version 5.1.0 [updated March 2011] The Cochrane Collaboration, 2011 Available from: www.cochrane-handbook.org.
[3] University of York Centre for Reviews and Dissemination, Systematic Reviews: CRD's Guidance for Undertaking Reviews in Health Care, CRD, University of York, York, 2009.
[4] N. Mantel, W. Haenszel, Statistical aspects of the analysis of data from retrospective studies of disease, J. Natl. Cancer Inst. 22 (4) (1959) 719–748.
[5] R. DerSimonian, N. Laird, Meta-analysis in clinical trials, Contr. Clin. Trials 7 (3) (1986) 177–188.

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