

Randomized Controlled Trials Assessing Continuous Outcomes for the use of Platelet-Rich Plasma in Knee Osteoarthritis Are Statistically Fragile: A Systematic Review

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INTRODUCTION: The aim of this study is to assess the statistical fragility of randomized controlled trials that assess the use of platelet rich plasma (PRP) for the treatment of knee osteoarthritis (OA) and report a continuous primary outcome measure with statistical significance.

METHODS: A systematic electronic search of MEDLINE, EMBASE, and Cochrane database was performed on July 26, 2023. All papers addressing the use of PRP for the treatment of symptomatic knee osteoarthritis were included that reported statistically significant primary continuous outcomes. The continuous fragility index (CFI) and continuous fragility quotient (CFQ) was calculated using approximative method as previously described using the mean and standard deviation of the outcomes of interest.

RESULTS: There was a total of 34 eligible outcomes for analysis. The overall median CFI across all included studies was 5.7 (IQR, 3.2 - 8.3). The overall median CFQ across all included studies was 0.131 (IQR, 0.037 - 0.225). Loss to follow-up was greater than the CFI in only 3 of 34 eligible outcomes (8.8%). The most analyzed outcome was the WOMAC total score (n=9) with a median CFI of 6.6 and median CFQ of 0.250. The outcome with the highest median CFI was the WOMAC stiffness subscale at 93. Spearman correlation analysis demonstrated a non-statistically significant trend towards decreasing CFI (-0.497) and a statistically significant decrease in CFQ (-0.681, $p = 0.03$) with increasing grades of osteoarthritis.

DISCUSSION AND CONCLUSION: This is the first study to assess CFI in the use of PRP for knee OA, with an overall CFI of 5.7 and CFQ of 0.131. The CFI for continuous outcomes after the use of PRP in knee OA can be considered reasonably robust and less fragile than dichotomous outcomes. Therefore, clinicians can have more confidence that patients receiving PRP will have improvements in continuous outcomes.

