Why minimal clinically important difference matters especially in meta-analysis?


Mikhail Saltychev MD, PhD, Ryan Mattie MD

Bonini-Rocha et al. conducted a meta-analysis of reports on the effectiveness of circuit-based exercises in people affected by stroke (1). As stated in the conclusions, the only significant finding was that “…circuit-based exercise presents better effects on gait when compared with conventional intervention”. That conclusion was based on the synthesis of the results of seven randomized controlled trials (RCTs). While otherwise the review is well-designed and performed, the interpretation of a particular finding regarding gait speed raises a question of whether or not clinical and statistical significance were mixed in this case. Indeed, the results suggested that there was a statistically significant difference between experimental and control groups in change of gate speed during follow-up: 0.11 (95% CI 0.02 to 0.19) m/s. While the estimate itself (0.11 m/s) is over, or at least close to, a minimal clinically important difference (MCID) for gait speed (set by the authors at 0.10 to 0.20 m/s), this number describes only the situation within a pooled sample used in the synthesis (2). On the other hand, what clinicians would expect from the paper is a result that could be generalized across the entire population of stroke survivors. For that purpose, a confidence interval should be used. In this particular case, attention should be drawn not to an estimate 0.11 m/s, but rather to a lower limit of 95% CI, which was 0.02 m/s. A small p-value means that these particular samples are probably different, or, in other words, there is a statistically significant difference between them. Instead, confidence limit describes what would happened if different samples are randomly drawn from the studied population. In this case, the difference could be as small as 0.02 m/s – substantially below the level of MCID of 0.10 m/s. Thus, the result should be considered clinically insignificant regardless of its p-value.

We agree with the authors that identifying publication bias is usually uncertain when the number of trials is less than ten. In this case, however, we were interested in determining if a publication bias was present since there were seven RCTs with results all pointing in the same direction. The analysis showed no publication bias (Figure1) and the p-value of Egger’s regression intercept was insignificant 0.27. While uncertain, the absence of publication bias across seven RCTs may support the generalization of the results of meta-analysis.

The results of meta-analysis should always be handled through the prism of clinical significance and based primarily on confidence intervals rather than on absolute estimates that describe the sample (here, seven RCTs together) but not the population of interest. To sum up, we feel that the conclusions of the review could be amended: based on the results of seven RTCs there was no evidence that circuit-based exercise provides better effects on gait, balance, or functional mobility of stroke survivors when compared with conventional interventions.

Keyword cover page, header, and sidebar. Video provides a powerful way to help you prove your point.
REFERENCES
