

Appraisal

Correspondence: Treadmill walking after stroke

We read with great interest the article by Nascimento et al.¹ In this systematic review, the authors attempted to understand the effectiveness of treadmill training compared to no/non-walking or overground walking in people after stroke. We appreciate the authors' results regarding the first part of the comparison, but find issue with the second part.

Nascimento et al concluded that there is moderate-quality evidence that the effect of treadmill walking on walking speed and distance is the same as or somewhat better than overground walking.¹ In this regard, we have some concerns about the selection of the studies included in the meta-analysis.

First, in the paper of Eich et al, while the experimental group walked on a graded treadmill with body weight support (15%, not meeting the inclusion criterion), the control group underwent Bobath-oriented physiotherapy, in which overground walking was not exclusive and performed in addition to other activities. Moreover, Bobath therapy is known to be less effective than task-specific training in improving walking outcomes.² Therefore, it can be deduced that the overground training performed by the control group was not strictly comparable with the treadmill training in terms of dosage and modality.

Second, in the study by Aguiar et al, the two groups were trained at different intensities: 60 to 80% of heart rate reserve (HRR) for treadmill training and $\leq 40\%$ of HRR for overground training.

However, training intensity affects the VO_2 and endurance of patients with stroke and, consequently, the gait speed and distance walked.³ To include these training groups in the meta-analysis, the intensity should have been the same.

Third, Olawale et al was excluded from the meta-analysis because the authors presented the mean and SD of the time taken to perform the 10m Walk Test instead of the gait speed. However, by application of binary operation properties and propagation of uncertainty formula,⁴ it is possible to calculate the mean and SD of gait speed. Therefore, the decision to exclude this study which is quite appropriate in terms of the review's rationale is not justified – it should have been considered in the analysis.

Based on these considerations, we have performed a new meta-analysis. In contrast to Nascimento's review¹ where the same outcome measure was represented in different ways (ie, mean value or change scores), for each included study we report in our forest plots the mean and SD of gait speed and distance walked after the intervention (Figure 1). From the new analysis, another perspective emerges in which no data show a benefit of treadmill training over overground walking in patients with stroke.

Finally, in Nascimento's review,¹ studies with body weight support $>10\%$ were excluded without a detailed explanation. This led to the exclusion of one of the largest trials on patients with stroke (about 400 subjects), in which the authors declared no superiority of

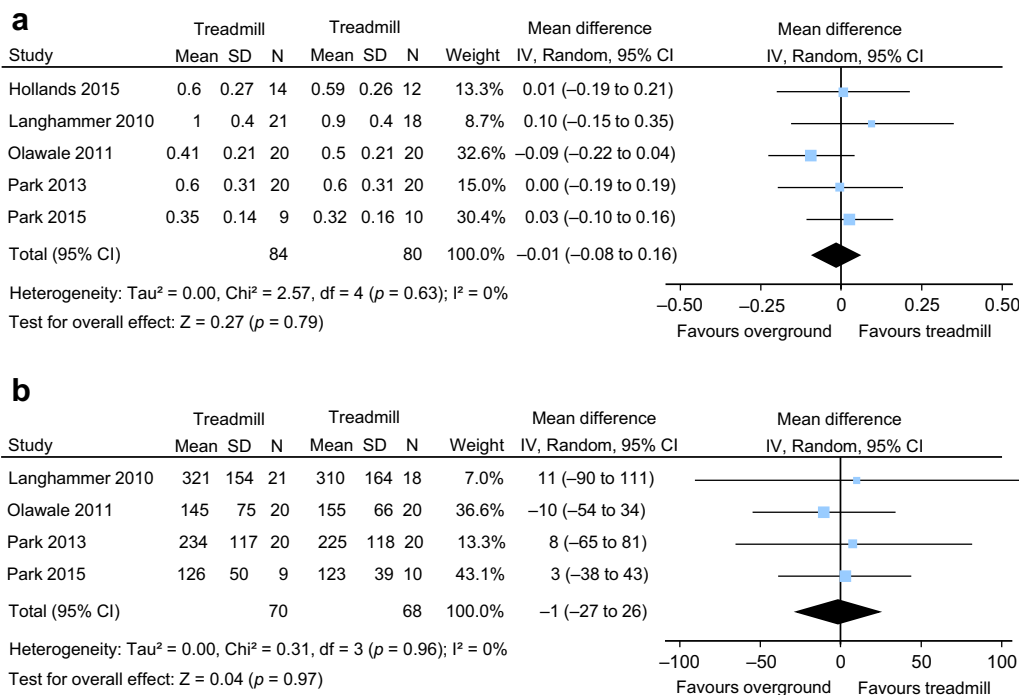


Figure 1. Detailed forest plot showing mean difference (95% CI) in the effect of treadmill walking versus overground walking on (a) walking speed (m/s) and (b) walking distance (m), immediately after the intervention period. No forest plot with follow-up data after the intervention period is presented, because there were insufficient studies included in the analysis, for the aforementioned reasons.

treadmill training and warned about the possibility of an augmented fall risk after treadmill intervention.⁵

Nascimento et al¹ have shed some interesting light on an important rehabilitation topic, but further work is necessary.

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Correspondence: Author response to Godi et al

We thank Dr Godi et al for their interest in our recently published systematic review that examined the effects of treadmill training in comparison with no/non-walking intervention or overground walking after stroke.¹ In the comparison of treadmill walking and overground walking, Dr Godi et al suggested that two randomised trials^{2,3} should be excluded based on differences in training intensity between the experimental and control groups. The fact that omitting a few studies resulted in a slight change in the estimated magnitude of the effect, suggests that there are still not enough trials to provide a robust estimate. On the other hand, the overall finding did not change, that is, there is no compelling evidence that treadmill training should be chosen over overground walking. Ambulatory people with stroke may benefit from walking training performed either on a treadmill or overground. The rationale for our inclusion criteria is outlined in the introduction, and the authors are free to perform their own systematic review based on different inclusion criteria.

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