

Analysis of intrinsic biomechanical factors are needed to identify parameters that may predict benefit from lateral wedge orthotics in medial knee osteoarthritis

Comment on the article by
Parkes MJ, *et al.*

Sirs,

Parkes and co-authors have recently published a meta-analysis about lateral wedge orthotics in *JAMA* (1). In this meta-analysis of randomised controlled trials (RCT(s)), pain response to lateral wedge insoles in patients with medial knee osteoarthritis (OA) was evaluated. The authors concluded that after accounting for heterogeneity in the control groups, there was no net pain palliative effect of wedge insoles over placebo neutral insoles in knee OA. It is important to note, however, that there is heterogeneity in treatment response to the use of orthotic wedges, at least some of which may be related to intrinsic biomechanical factors. The wedge introduces a valgus component into those that have tibial varum or subtalar varus, and the anatomical ability to compensate may determine whether or not there is an individual unloading response to the treatment. As only some individuals wearing orthotic wedges actually have significant unloading of their knees, it may be difficult to assess the potential efficacy of the treatment by aggregating heterogeneous populations for analysis. We have recently observed that those subjects who actually achieve mechanical unloading with lateral wedges have significantly greater distal tibial varus angulation compared to those who do not achieve significant load reduction (2), suggesting that distal

tibial varus may represent an important predictor of beneficial load reduction in patients with medial knee OA. Moreover, it may be of interest that whereas Asian populations are known to have a greater distal tibial varus angulation than Western populations (3-5), and therefore may have a better overall population response to lateral wedges. The RCTs that included neutral orthotic controls in the survey were predominantly from Western countries, whereas those using control groups without such insoles were from Asia and Africa. The only RCT that studied a neutral insole in a non-western population actually evaluated the influence of 'heeled shoes' on the efficacy of lateral wedges (6).

Notwithstanding the failure in this meta-analysis to demonstrate significant pain palliation in heterogeneous groups using wedges, it remains likely that sustained correction of aberrantly high joint loading may have substantial symptomatic as well as structural benefit to OA patients over long periods of time. In the absence of a responder analysis that includes relevant biomechanical parameters, including distal tibial varus, it is difficult to conclude that wedge orthotics are truly of no incremental benefit above placebo in select populations. Especially in the context of a disease of such enormous prevalence as knee OA, it would seem that a treatment that may be beneficial for a large minority of patients would still be worth exploring, even if it is not universally applicable.

In conclusion, while the metaanalysis by Parkes *et al.* failed to identify clear benefit from lateral orthotic wedges in knee OA, important subpopulations of patients have not been studied and for which there may be compelling biomechanical reasons to expect that wedges may prove helpful. Hence, rather than concluding that wedges are ineffective in knee OA, we suggest

that additional studies targeting appropriate subpopulations are necessary.

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