Reviewer’s report

Title: Stiffness modification of two ankle-foot orthosis types to optimize gait in individuals with non-spastic calf muscle weakness - a proof-of-concept study

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Reviewer: Nachiappan Chockalingam

Reviewer's report:

This is a well written paper emerging from a reasonably designed study. The authors have attempted to test 2 AFOs which have allowance for DF which can be adjusted. The authors seem to indicate that the effects of the AFO stiffness on gait parameters and energy expenditure is being examined. However, on reading the paper it appears that they are actually testing the AAAFO. By making it stiffer the authors are limiting DF. This needs to be clarified upfront.

One can easily argue that we don't really know the requirements of each patient (for AAAFO). The authors outline that the participants have Normal knee flexion and extension (Table 1). This leads to the assumption that the authors are stating, subject A had 0 DF and 10 PF, Subject B 0 DF and 10 deg PF and subject C 40 DF and 10 PF. Also one need to assume that the last figure (60/45/0) is DF during weight bearing?

The authors need to clearly state how DF was measured. It needs to be with Knee extended passively DF to resistance. In general clinical practice and in related research, the weight bearing measure is confusing because it doesn't state whether the knee is flexed. Weight bearing DF is not a true length of gastroc as the knee is flexed.

The results show that with shoes, the knee flexion in single stance was 5.1 deg, 2.8 deg and 16.8 respectively. One can see that the values change with stiffness, which is in effect a change in AAAFO, which affects the knee. This needs to be adequately described within the paper.

Overall, this is a good study which shows that stiffness of the AFO effects gait. However, the discussion should clearly outline that the stiffness is mimicking AAAFO. In addition, the authors should attempt to get the details on passive knee extension which can help the readers to make sense of the data and make the paper clinically relevant.

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