Does the use of orthoses improve self-reported pain and function measures in patients with plantar fasciitis? A meta-analysis

Lee SY, McKeon P, Hertel J

CRD summary
This review concluded that foot orthoses were associated with significant short-, medium- and long-term improvements in pain and function in patients with plantar fasciitis. The authors' conclusions should be interpreted with caution in light of the questionable methods used to pool diverse studies, a lack of good-quality data and the small sample sizes.

Authors' objectives
To assess the effect of orthoses in patients with plantar fasciitis on measures of self-reported pain and function.

Searching
PubMed, SPORTDiscus and CINAHL were searched for English-language studies from inception to December 2007; search terms were reported. The search was cross-referenced to identify additional studies.

Study selection
Randomised controlled trials (RCTs) and prospective cohort studies were eligible for inclusion if they evaluated the efficacy of foot orthoses in patients with plantar fasciitis using self-reported pain and/or function; studies had to report means, standard deviations and sample sizes of each group. Various types of in-shoe orthoses were considered, including cushioned insoles, arch supports and customised pads. The outcomes of interest were reduction in pain and change in foot function. A number of different pain and function measurement tools were used in the included studies: foot function index; foot and ankle outcome score; foot health status questionnaire; visual analogue pain scale; and verbal pain scale. Mean age ranged from 20 to 71 years of age; in most studies age ranged from 40.4 to 59.9 years. The authors stated that most studies compared different types of foot orthoses with no true control groups.

The authors stated neither how the data were selected for the review nor how many reviewers performed the data extraction.

Assessment of study quality
Two authors assessed study quality using the 10-point Physiotherapy Evidence Database (PEDro) score (maximum score 10).

It was unclear if the validity assessment was performed independently or not.

Data extraction
For continuous outcomes (pain and function), means and standard deviations were converted into a percentage of total possible score and all results standardised. Outcomes were divided into three time periods: short-term (less than six weeks); medium-term (six to 12 weeks); and long-term effects (>12 weeks).

The authors did not state how many reviewers performed the data extraction.

Methods of synthesis
Data on orthoses were apparently pooled using meta-analysis; methods were not reported. It appeared that the authors used before/after data from only orthoses treatment groups, but it was not at all clear. Pooled orthoses data were then compared with data at 12 weeks follow-up from the night splint treatment arm of one study; this treatment arm had 15 patients.
Results of the review
Six studies were included in the review (n=277, range 10 to 101): four RCTs (n=252) and two prospective cohort studies (n=25). The mean PEDro score was 6.2 (range 4 to 10). Duration of follow-up ranged from two to 52 weeks.

At all three follow-up periods following orthotic intervention there were significant reductions in pain (six studies) and significant increases in function (three studies).

**Pain:** short-term (Z=24.1%, 95% CI 19.7 to 28.5); medium-term (Z=15.2%, 95% CI 11.8 to 28.5); and long-term (Z=37.0%, 95% CI 32.3 to 41.9).

**Function:** short-term (Z=21.9%, 95% CI 16.0 to 27.9); medium-term (Z=15.9%, 95% CI 11.2 to 20.7); and long-term (Z=23.8%, 95% CI 18.9 to 28.7).

Authors' conclusions
Foot orthoses in patients with plantar fasciitis reduced pain and increases function at short-term, medium-term and long-term follow-up periods.

CRD commentary
The review question and inclusion criteria were clear. A small number of databases were searched for English-language publications and it was unclear whether unpublished studies were sought; therefore, language bias could have been present and some studies may have been missed. The study selection and data extraction processes were not clearly described, which made it difficult to rule out reviewer error and bias. Appropriate criteria were used to assess the quality of the included studies, but it was unclear if the validity assessment was performed independently or not; four studies scored less than 6 on the quality score, which highlighted the poor quality of the included studies. In addition, four of the included studies comprised less than 50 participants. Data were pooled using meta-analysis, but the methods were unclear. Pooling data seemed inappropriate given the diversity of study design and lack of consistent control groups. It appeared also that pooled before/after data were compared with a control group selected by the authors; this was questionable. A narrative synthesis may have been more appropriate given the limitations and diversity of the included studies. In light of questionable methods used to pool diverse studies, lack of good-quality data and the small sample sizes, the authors' conclusions should be interpreted with caution.

Implications of the review for practice and research
**Practice:** The authors did not state implications for practice.

**Research:** The authors stated that, to increase study quality, there was a need for future studies to ensure that examiners were blinded whilst administering the treatment and measuring outcomes. Future studies should also consider the inclusion of a control group that did not receive orthoses. Comparisons should be sought with various types of orthoses.

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This is a critical abstract of a systematic review that meets the criteria for inclusion on DARE. Each critical abstract contains a brief summary of the review methods, results and conclusions followed by a detailed critical assessment on the reliability of the review and the conclusions drawn.