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The effect of night splints in the treatment of plantar fasciitis: a systematic literature review

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Background

• Plantar fasciitis occurs in more than 2M Americans each year and is the most common cause of acute heel pain.1,2

• Night splints are one conservative intervention that is available to patients affected by plantar fasciitis, but there is limited evidence on their effectiveness.

• To our knowledge, this is the first review to evaluate the efficacy of night splints.

Methods

Article selection process:

Databases: CINAHL, PubMed, Cochrane, PEDro, Scopus, Sports Discuss, and Ovid-Medline

Search Terms: plantar fasciitis, physical therapy, night splints. All three search terms were combined with "AND".

Evaluation: The GRADE approach was used to evaluate the quality of each paper.3

Results

Six papers that met the established inclusion and exclusion criteria were included in this systematic review. Four papers were observational and two papers were randomized controlled trials. The evidence ranged from high to very low quality. The recommendation for use of night splints was weak in all six papers.

Table 1

<table>
<thead>
<tr>
<th>Study</th>
<th>Year</th>
<th>Design</th>
<th>Inclusion Criteria</th>
<th>Exclusion Criteria</th>
<th>Length of intervention</th>
<th>Outcome measurement</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lee et al. 2012</td>
<td>2002</td>
<td>RCT</td>
<td>Subjects aged 18-55</td>
<td>No serious comorbidities</td>
<td>6 weeks</td>
<td>Foot function index (FFI) and Visual Analog Scale (VAS)</td>
</tr>
<tr>
<td>Logan et al. 2000</td>
<td>2000</td>
<td>RCT</td>
<td>Subjects aged 18-60</td>
<td>No serious comorbidities</td>
<td>6 weeks</td>
<td>Foot function index (FFI) and Visual Analog Scale (VAS)</td>
</tr>
<tr>
<td>Sheridan et al. 2012</td>
<td>2012</td>
<td>RCT</td>
<td>Subjects aged 18-60</td>
<td>No serious comorbidities</td>
<td>6 weeks</td>
<td>Foot function index (FFI) and Visual Analog Scale (VAS)</td>
</tr>
<tr>
<td>Rose et al. 2012</td>
<td>2012</td>
<td>RCT</td>
<td>Subjects aged 18-60</td>
<td>No serious comorbidities</td>
<td>6 weeks</td>
<td>Foot function index (FFI) and Visual Analog Scale (VAS)</td>
</tr>
<tr>
<td>McShane et al. 2012</td>
<td>2012</td>
<td>RCT</td>
<td>Subjects aged 18-60</td>
<td>No serious comorbidities</td>
<td>6 weeks</td>
<td>Foot function index (FFI) and Visual Analog Scale (VAS)</td>
</tr>
<tr>
<td>Noppakarab et al. 2012</td>
<td>2012</td>
<td>RCT</td>
<td>Subjects aged 18-60</td>
<td>No serious comorbidities</td>
<td>6 weeks</td>
<td>Foot function index (FFI) and Visual Analog Scale (VAS)</td>
</tr>
</tbody>
</table>

Discussion

The evidence presented in this systematic review included six papers that implemented one of four types of night splints: posterior,6,8 anterior,11 sock-type or Dynamoplant (Severn Park, MD). From the available evidence, it is suggested that night splints may be helpful in treating the common symptoms of plantar fasciitis.

• Two papers discussed in this review used posterior-tension splints to maintain ankle dorsiflexion and toe extension.3,5

• Logan et al.3 focused on the use of autologous blood injection in subjects with high spasticity, which prevented a definitive interpretation on the effectiveness of posterior night splints.

• Beyzadeoglu et al.5 suggested that the use of posterior night splints has no significant effect on the long-term recurrence of symptoms.

• One paper investigated the use of anterior tension splints.7

• Rose et al.7 suggested that patient compliance in wearing anterior night splints is better than for posterior splints because the plantar fasciitis need not be removed for walking and in general is more comfortable due to better heat dissipation.

• One paper compared the use of anterior and posterior night splints.8

• Altard et al.8 reported that the use of anterior night splints led to decreased sleep disturbances and was consequently better tolerated by the subjects.

• One paper investigated a sock-type night splint.4

• Beyzadeoglu et al.4 suggested that the adjustable and soft night splint aids in compliance by decreasing the level of discomfort, however, the activity level of the subjects was not presented and there was significant variability in the duration of heel pain (2-24 months).

• One paper utilized a Dynamoplant for the treatment of plantar fasciitis.4

• Sheridan et al.4 suggested that the dynamic splints have the ability to maintain dorsiflexion while the connective tissues adoptively elongate, which is a key difference compared to other types of splinting.

Limitations

• Papers written in English

• Published from June 2005 to June 2015

• Patients were at least 18 years old

• No prior surgical interventions

• Overall low level of evidence

• Two RCTs

• Four observational

• Short follow-ups

Conclusions

The available evidence suggests that night splints may be helpful in treating the common symptoms of plantar fasciitis, with anterior splints being better tolerated than posterior splints.

Future Research

• More consistent ankle positions

• Most effective ankle positions (neutral plantargrade vs. dorsiflexed)

• Long term effects of splinting

• Longer follow-up studies

• Larger sample sizes

• MoreRCTs

• Use of functional outcome measures

• Insight into patients’ activity levels

• More diverse population in regards to BMI

References