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

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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.

Objective

To investigate the use of night splints for the treatment of plantar fasciitis and the current evidence regarding their ability to affect symptoms associated with plantar fasciitis.

Methods

Article search 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.

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.

Patient characteristics and interventions used to treat plantar fasciitis

<table>
<thead>
<tr>
<th>Authors</th>
<th>Year</th>
<th>Number of Subjects</th>
<th>Age Range</th>
<th>Mean Age</th>
<th>Sex</th>
<th>Inclusion Criteria</th>
<th>Length of Treatment</th>
<th>Outcome Management</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lee et al.</td>
<td>2012</td>
<td>60 (14/46)</td>
<td>Yes (+)</td>
<td>No</td>
<td>No</td>
<td>MRI, US, CT, x-ray</td>
<td>6 weeks</td>
<td>Foot Function Index (FFI), AOFAS Heal Scale</td>
</tr>
<tr>
<td>Logan et al.</td>
<td>2004</td>
<td>15 (1/4)</td>
<td>Yes (+)</td>
<td>No</td>
<td>No</td>
<td>MRI, US, CT, x-ray</td>
<td>12 weeks</td>
<td>Foot and Ankle Observational Gait Scale (FAOGS)</td>
</tr>
<tr>
<td>Sheldon et al.</td>
<td>2004</td>
<td>43 (9/34)</td>
<td>Yes (+)</td>
<td>No</td>
<td>No</td>
<td>MRI, US, CT, x-ray</td>
<td>28 weeks</td>
<td>foot and ankle observational gait scale (FAOGS)</td>
</tr>
<tr>
<td>Engstrom et al.</td>
<td>2007</td>
<td>11 (1/4)</td>
<td>Yes (+)</td>
<td>No</td>
<td>No</td>
<td>MRI, US, CT, x-ray</td>
<td>6 weeks</td>
<td>Foot and Ankle Functional Index (FAFI)</td>
</tr>
<tr>
<td>Engstrom et al.</td>
<td>2010</td>
<td>44 (18/26)</td>
<td>Yes (+)</td>
<td>No</td>
<td>No</td>
<td>MRI, US, CT, x-ray</td>
<td>6 months</td>
<td>Foot and Ankle Disability Index (FADI)</td>
</tr>
</tbody>
</table>

Discussion

The evidence presented in this systematic review included six papers that implemented one of four types of night splints: posteriors,2,9 anterior3,10 sock-type6 or Dynasplint8 (Severna Park, MD). From this 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.4, 9
- Logan et al.5 focused on the use of autologous blood injection in a subject with calf spasticity, which prevented a definitive interpretation on the effectiveness of posterior night splints.
- Beyzadeoglu et al.2 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 Ros et al. suggested that patient compliance in wearing anterior night splints is better than for posterior splints because the splint does not prevent night walking and in general is more comfortable due to better heat dissipation.
- One paper compared the use of anterior and posterior night splints.6 Altard et al.4 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 Altard et al.4, 5 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 Dynasplint for the treatment of plantar fasciitis.4 Sheridan et al.4 suggested that the dynamic splints have the ability to maintain tension while the corrective tissues adaptively 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
- Patient compliance
- Larger sample sizes
- More RCTs
- Use of functional outcome measures
- Insight into patients’ activity levels
- More diverse population in regards to BMI

References