INTRODUCTION

The feet of patients with rheumatoid arthritis (RA) are often affected by deformities and pain during walking. This is a primary cause of limited mobility in this patient group. The use of orthotic insoles is common in patients with RA and often part of an early conservative treatment which is strongly recommended to protect the rheumatoid foot from potentially destructive processes [1]. The aim of the orthotic treatment is to ensure physiological loading of the feet and to prevent overloading. In a progressive disease like RA it is important to prevent or limit the ongoing degenerative processes in the foot joints.

Previous investigations demonstrated the effect of special elements of orthotic insoles like medial postings or metatarsal pads which are often non-systematic and subject specific [2]. Mejjad et al. [3] showed that orthotic insoles decreased pain but did not influence gait function in rheumatoid patients with foot pain. However, there is a lack of evidence concerning the enduring effect of orthotic insoles on foot loading and pain which makes it difficult to establish general guidelines.

The aim of this study was to investigate long term effects of orthotic insoles in patients with RA. Custom designed corrective or cushioning insoles were used depending on patient’s foot status. Data were collected by means of plantar pressure distribution measurements before using orthotic insoles and after 12 months of use.

PATIENTS & METHODS

Fifty-nine patients, 53 females and 6 males with diagnosed RA (age 58.9 ± 9.5 years; BMI 26.3 ± 5.9 kg/m²) received custom designed orthotic insoles: corrective insoles in case of flexible foot joints and cushioning insoles in case of contracted foot joints. Exclusion criteria were other systemic diseases like diabetes, neurological disorders and previous foot surgery.

Plantar pressure measurements were performed with a capacitive platform (EMED ST4, Novel GmbH Munich) (Fig.1). Five barefoot steps of the right foot were recorded before and after 12 months of using orthotic insoles. The pressure patterns were subdivided into ten regions of interest and analyzed with respect to peak pressure (PP), maximum force (MF), impulse, contact time (CT), and contact area (CA).

RESULTS

The results revealed a significant improvement in the FFI-score by 23.8% after 12 months (Table 1). The HAQ and RADAI scores did not show any significant changes.

Table 1: Results of scores (mean values)

<table>
<thead>
<tr>
<th></th>
<th>1st measurement</th>
<th>2nd measurement</th>
<th>p-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>FFI</td>
<td>30.58</td>
<td>25.30</td>
<td>0.018</td>
</tr>
<tr>
<td>HAQ</td>
<td>1.5</td>
<td>1.49</td>
<td>n.s.</td>
</tr>
<tr>
<td>RADAI</td>
<td>3.55</td>
<td>3.63</td>
<td>n.s.</td>
</tr>
</tbody>
</table>

Pedobarographic data showed only few significant differences in pressure patterns after 12 months (Fig.2). Peak pressures increased in the heel and midfoot areas but did not change in the forefoot and toe regions. Impulses did not change except for an increase in medial midfoot and 2nd toe-region. The maximum force increased in hallux, 2nd toe and MTH1 region as well as in heel and medial midfoot. Contact area decreased in MTH2, lateral midfoot and heel. Contact time was reduced only in toe3-5 region. Correlation of scores and pedobarographic data revealed only weak relationships and did not allow any conclusions.

DISCUSSION

The lower FFI-Score indicates a decreased foot pain and reduction of disability. These results are in accordance with previous findings. Woodburn and colleagues [1] showed a decrease of 23.1% in FFI-Score in rheumatoid patients after use of orthotic insoles for 30 months.

Only few significant changes in pedobarographic parameters after 12 months suggest stable foot loading characteristics within this period. Especially invariant values in critical regions like forefront and hallux could indicate a stagnation of progression of foot degeneration. The increase of force values under the first ray shows an improvement of the foot loading characteristics in terminal stance and pre-swing phase without increase of peak pressure values. Contact times showed no difference after 12 months which is in accordance with Mejjad et al. [3] who found no change in walking speed with the use of orthotic insoles.

In summary pedobarographic data suggest a decrease of the ongoing processes of RA which could enable RA patients to retain their mobility.

Minor differences between the 1st and 2nd measurement in pedobarographic data and HAQ and RADAI-Scores may be responsible for the poor correlation values.

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REFERENCES


FURTHER INFORMATION

anagel@uni-muenster.de, www.motionlab-muenster.de