ABSTRACT

Background: Arthritis and other rheumatic conditions are the leading causes of disability among adults in the United States. The purpose of this report was to describe the self-reported functional limitations of a group of patients with end-stage ankle arthrosis. Method: Patients who presented for operative management of end-stage ankle arthrosis at the University of Minnesota and Harborview Medical Center completed a Musculoskeletal Functional Assessment (MFA) as part of their preoperative clinical evaluation. Data from patients evaluated during the time period April, 1995, through May, 2004, were used for this project. Results: Four hundred and twenty-six patients with the diagnosis of end-stage ankle arthrosis completed baseline questionnaires. Six of the 426 patients received care on both ankles during the time of this project. The average age of patients at the time of completion of the questionnaire was 56.7 years. There were 241 men and 185 women. The primary underlying causes identified by the treating surgeon at the time of surgery were primary osteoarthritis with no known prior trauma (66), previous trauma (tibial fracture, foot fractures, or ankle ligamentous disruption) (296), rheumatoid arthritis (24), no known cause (21), and a variety of diseases or infections (19). In all domains, the patients with end-stage ankle arthrosis showed statistically significant differences from a general population sample. Conclusions: The effects of ankle arthritis as demonstrated by this data are severe. Most of these patients were severely limited in function. Without a data-driven understanding of the limitations the patients have, it is difficult to make an effective argument for focused research to solve the problems.

Without understanding the patients’ needs, it is impossible to assess the effect of treatment. The information in this paper provides a baseline understanding of effect of the current functional limitations of patients with end-stage ankle arthrosis.

Key Words: Ankle; Functional Outcomes; MFA; Osteoarthritis

INTRODUCTION

Arthritis and other rheumatic conditions are among the most common chronic diseases, affecting 70 million adults in 2001 in the United States and comprise the leading causes of disability among adults in the United States. The prevalence of arthritis increases with age, affecting approximately 60% of the population in the United States over the age of 65 years. Although the incidence and effects of hip and knee arthritis are well known, there is comparatively little information about the causes, effects, prevalence, or treatment of ankle arthritis. The purpose of this report was to describe the self-reported functional limitations of a group of patients with end-stage ankle arthrosis.

MATERIALS AND METHODS

Four hundred and twenty-six patients who presented for operative management of end-stage ankle arthrosis at the University of Minnesota and Harborview Medical Center completed a Musculoskeletal Functional Assessment (MFA) as part of their clinical evaluation. All patients completed this questionnaire in person at the time of their preoperative clinic visit. The average age of patients at the time of completion of their questionnaire was 56.7 years. There were 241 males and 185 females.

The primary underlying causes identified by the treating surgeon at the time of surgery were primary osteoarthritis with no known prior trauma (66), previous trauma (tibial fracture, foot fracture, or ankle ligamentous disruption) (296), rheumatoid arthritis (29), no...
known cause (21), and a variety of diseases or infections (19).

Data from patients evaluated during the time period April, 1995, through May, 2004, were used for this functional assessment project. All demographic information was obtained by chart review either at the time of preoperative visit or retrospectively. Six patients who received treatment on both ankles during this time period were counted twice, because treatment of the contralateral ankle occurred more than 3 months after the index ankle.

The MFA is a 101-item outcomes instrument designed to measure function in patients with a broad range of musculoskeletal conditions, both at time of presentation and over time. It has been evaluated for its responsiveness, validity, and reliability. This instrument has been tested for construct and criterion validity against the SF-36 and WOMAC. Disease-specific reference values as well as general population normative values have been compiled to enable clinicians to compare their patients’ scores to a large population with similar disease as well as to a healthy population. This study was approved by both institutional review board committees at the University of Minnesota and Harborview Medical Center.

RESULTS

Four hundred twenty-six patients with the diagnosis of end-stage ankle arthrosis completed their baseline questionnaires. Six of the 426 patients received care on both ankles during the time of this project.

MFA’s administered before treatment showed no difference in functional limitations between the two sites (University Minnesota & Harborview) and thus are presented in a combined format in Table 1.

In all domains, the patients with end-stage ankle arthrosis showed statistically significant differences from a general population sample \( (p < .05) \). The general population sample ranged in age from 18 to 55 years; 50% of the population was from 18 to 35 years. The reference disease population of patients with tibial, foot, or ankle fracture was 9 to 12 months after injury and the mean age was 40 years. Most patients received operative treatment.

DISCUSSION

There is little information about primary ankle arthrosis and its functional limitations. In 1990, an estimated 38 million Americans were affected by arthritis. The Burden of Musculoskeletal Conditions as reported by the World Health Organization in honor of the Bone and Joint Decade estimated that 10% of the population over the age of 60 have osteoarthritic joint pathology. By 2020, nearly 60 million people may be affected. Forty-three million persons were estimated to have arthritis in 1997 according to the National Health Interview Survey (NHIS). However, this data is recorded as self-reported. Healthy people data reports indicate that in 1997, 28% of Americans had activity limitations because of arthritis. Data are broken down by race, ethnicity, and gender but there are no national data specific to ankle arthrosis.

When looking at osteoarthritis in the feet, overall prevalence per 100 persons between the ages of 24 to 74 years was 20.8 (20.2 in men, 21.4 in women). The prevalence of moderate and severe osteoarthritis per 100 persons between the ages of 24 and 74 years

<table>
<thead>
<tr>
<th>Category</th>
<th>End Stage Ankle Arthrosis Mean (SD)</th>
<th>General Population Mean (SD)</th>
<th>Tibia, Foot, Ankle Fracture Mean (SD)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mobility</td>
<td>55.2 (17.4)</td>
<td>11.94 (12.73)</td>
<td>28.1 (23.7)</td>
</tr>
<tr>
<td>Fine Motor</td>
<td>12.8 (23.8)</td>
<td>3.66 (12.9)</td>
<td>5.3 (16.9)</td>
</tr>
<tr>
<td>Housework</td>
<td>52.3 (23.8)</td>
<td>7.77 (15.38)</td>
<td>22.8 (25.3)</td>
</tr>
<tr>
<td>ADL</td>
<td>13.1 (15.8)</td>
<td>1.72 (4.39)</td>
<td>6.6 (11.5)</td>
</tr>
<tr>
<td>Sleep</td>
<td>43.3 (30.8)</td>
<td>15.45 (21.88)</td>
<td>24.7 (29.5)</td>
</tr>
<tr>
<td>Leisure</td>
<td>75.2 (23.3)</td>
<td>9.96 (21.88)</td>
<td>37.5 (34.4)</td>
</tr>
<tr>
<td>Family/Relationships</td>
<td>22.4 (26.7)</td>
<td>7.89 (16.61)</td>
<td>11.9 (19.7)</td>
</tr>
<tr>
<td>Cognition</td>
<td>25.0 (36.5)</td>
<td>6.1 (17.34)</td>
<td>10.8 (27.7)</td>
</tr>
<tr>
<td>Emotion</td>
<td>54.6 (19.7)</td>
<td>15.64 (12.75)</td>
<td>29.7 (18.9)</td>
</tr>
<tr>
<td>Job</td>
<td>44.8 (44.8)</td>
<td>5.29 (16.71)</td>
<td>32.1 (42)</td>
</tr>
<tr>
<td>Total</td>
<td>39.5 (14.4)</td>
<td>9.26 (8.89)</td>
<td>21 (11.4)</td>
</tr>
</tbody>
</table>
The prevalence of symptomatic osteoarthritis in the feet per 100 persons between the ages of 15 and 74 years is 2.0 (1.6 in men, 3.6 in women). This information was standardized to the 1990 census data.

While symptomatic osteoarthritis develops in the ankle, it is quite rare (less than 1%), and the prevalence does not seem to increase with age. It is estimated that the prevalence of symptomatic arthritis in the ankle is approximately nine times lower than that in the knee and hip. Several studies have tried to assess osteoarthritis of the ankle through cadaver assessment and radiologic analysis. These studies have estimated ankle cartilage degeneration at a wide range of 2% to 98% of all ankles, all dependent on the study definition and measure for cartilage degeneration. It is unclear what visible degeneration should be considered as osteoarthritis.

Unlike other forms of arthritis (knee, hip), ankle arthritis has been found more frequently in men than in women at a ratio of 1:0.8. The only occupation that has been associated with ankle osteoarthritis is ballet.

The effects of ankle arthritis as demonstrated by this data are severe. We should stress that these are patients with end stage ankle arthrosis who are seeking operative treatment. Conservative treatment had failed in all patients and most were severely limited in function. MFA scores in this population were more than triple that found in the patients who had no known functional limitations. Patient dysfunction was double that found in patients one year after an ankle or foot fracture. Without a data-driven understanding of the limitations the patients have, it is difficult to make an effective argument for focused research to aid these patients. Without understanding the patients’ needs, it is impossible to assess the effect of treatment. The information in this paper provides a baseline understanding of the current functional limitations of patients with end-stage ankle arthrosis. It is obvious that ankle osteoarthritis has a significant impact on the well being of the patient.

Note: The MFA may be obtained at http://www.ortho.umn.edu/research/clinicaloutcomes.html

REFERENCES

15. Slater, E; Bales, V: Arthritis, osteoporosis, and chronic back conditions. CDC, Healthy People 2010; 2002.