

THE USE OF ORTHOSES IN REHABILITATION OF NEUROLOGICAL PATIENTS

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Abstract

The use of orthoses and other rehabilitation devices is an important part of neurological rehabilitation. The following article presents data about the orthotic use and the results of inpatient rehabilitation of 75 adult patients with neurological diseases or traumatic brain injuries. The acquired data indicate the differences between different age groups regarding

the results of rehabilitation as well as the orthotic use. The highest FIM score was achieved within the group of patients under the age of 55. This group of patients was prescribed also the highest rate of orthoses. The analysis of the orthoses use shows that these are the most widely used in the group of patients within the middle range of functional disability. The use of other rehabilitation devices is more equally spread among different functional and age groups.

INTRODUCTION

Patients with neurological diseases or injuries often need appropriate rehabilitation treatment to help them recover their functional abilities and to improve their quality of life (1). The prognosis and the rehabilitation results are influenced by several circumstances (2). Rehabilitation procedures as well as the prescription of an orthosis and other rehabilitation devices are chosen for each patient individually according to their special needs. Orthoses are used in all stages of rehabilitation. They are most commonly prescribed to provide support and improve gait (3, 4) or to reduce pain and prevent contractures of spastic extremities (5, 6). An orthosis may be prescribed for a limited period of time, for a longer term or for permanent use.

The article shows the results of the inpatient rehabilitation of adult neurological patients in the years 2006 and 2007 including the data about the use and prescription of orthoses.

METHODS AND SUBJECTS

The data were collected from patient records of all adult neurological patients, who were admitted to our department in the years 2006 and 2007. All patients were transferred to our department from an acute setting. Fifteen most disabled patients with extremely poor rehabilitation potential (persistent vegetative state, terminal stage of malignant diseases etc), who needed only skilled nursing and medical care, were excluded from the study.

The use of orthoses and other rehabilitation devices were compared within different age and functional groups. Func-

tional groups were formed by using Functional Independence Measurement (FIM) ratings gained at discharge.

RESULTS

A total of 75 patients (40 males, 35 females) with various neurological impairments were included in the study. Of these, 50 stroke patients (CVI), 5 patients with serious traumatic brain injuries, 8 patients with degenerative brain diseases or other impairments of the central nervous system (Parkinson's disease, ALS, states after infections of CNS or states after neurosurgery) and 12 patients with spinal cord injuries or severe polyneuropathies. Among patients with stroke, there were 24 with right sided hemiparesis and 26 with left side hemiparesis. The average age was 69.6 years SD 11.9 (from 43 to 91 years). The average age in the largest group of stroke patients was 69.8 years SD 10.9 (from 43 to 87 years). The average age of all other groups was 69.4 years SD 12.6 (from 49 to 91 years). Patients were divided into 5 age groups: group up to 55 years, 56 to 65, 66 to 75, 76 to 85 years and older than 86 (Figure 1).

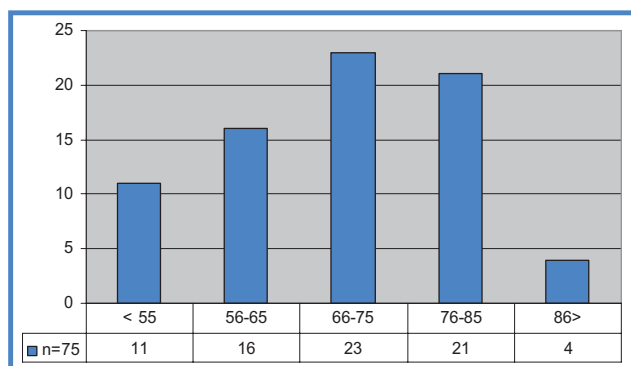


Figure 1: Age groups of patients

The average length of stay was 45 days. The mean admission FIM was 46 points (mFIM 26 points, cFIM 20 points). The mean discharge FIM was 76 points (mFIM 52 points, cFIM 24 points). Differences between age groups were noticed at the end of the rehabilitation. Age groups varied in the length of stay as well as in the final functional assessment (Figure 2). The longest stay was recorded in the youngest group of patients (under age 55). However, the same group also achieved the highest discharge FIM score.

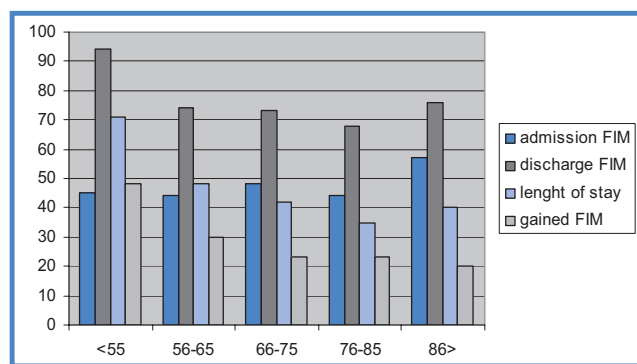


Figure 2: Differences between age groups

The highest rate of orthotic use was recorded in the youngest group of patients whereas the lowest rate was observed in the oldest group (Figure 3). Higher rate of orthoses use coincides with faster improvement of functional abilities in rehabilitation process.

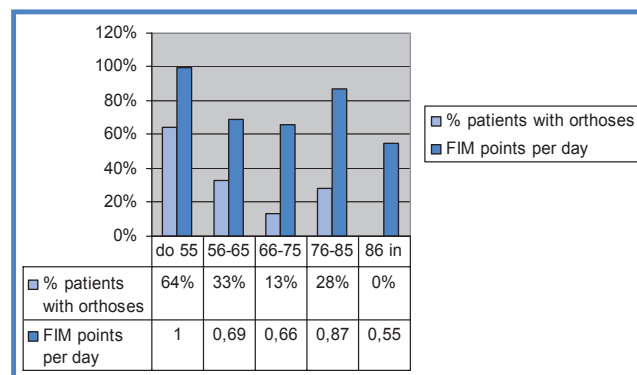


Figure 3: Comparison of orthoses prescription and improvement in rehabilitation

The study showed that orthoses for lower extremities were used more often (58% of all prescribed orthoses) than other orthoses. Among these, the ankle foot orthoses (plastic leaf-spring AFO, plastic solid AFO, metal AFO) were most commonly prescribed. Knee orthoses were rarely used. For the upper extremities (42% of all prescribed orthoses) the static wrist hand orthoses and shoulder slings were used in most cases.

The prescription of other rehabilitation devices (wheelchairs, walkers, orthopaedic shoes and other utilities for daily activities), which cover a wide range of disabilities,

was much more equally spread among different functional groups (Figure 4).

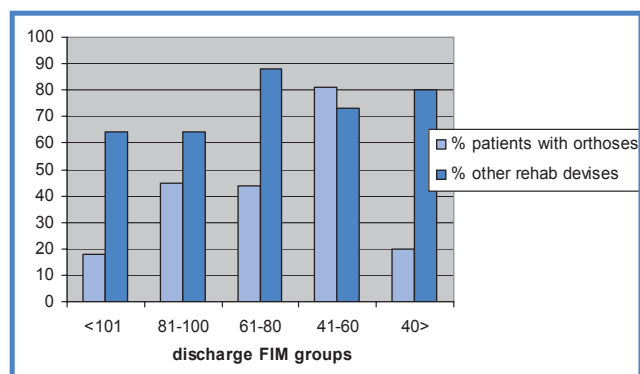


Figure 4: Prescription of orthoses and other rehabilitation devices for different functional groups

DISCUSSION

In this study the youngest group achieved the highest FIM score at discharge. Better FIM was reached partly due to longer stay in our rehabilitation department (Figure 2). However, the same group showed the fastest trend of improvement too. On average, patients under age 55 were gaining 1 point on FIM per day, whereas patients in older groups were obtaining lower scores. The oldest group was gaining only 0.55 point per day (Figure 3). The result indicates better rehabilitation potential of younger patients with neurological impairment.

Although one can observe an obvious correlation between the percentage of patients using orthoses and their higher rate of improvement it cannot be confirmed that the relation between these two issues is immediate. Therefore it has to be more carefully interpreted. Firstly, the number of patients and orthoses included in the study was too low to be also statistically significant. Secondly, even if it were statistically significant, we could not claim that better result (number of FIM points per day) is directly influenced by the use of orthoses. Successful rehabilitation depends on the high number of factors, the prescription of a suitable orthosis being just one of important therapeutic interventions in this complex process.

In order to find out whether there exist any correlations between functional disability and the number of prescribed orthoses, patients were divided into subgroups according to their discharge FIM ratings (Figure 4). The lowest percentage of orthoses use was recorded in the groups with mild and severe disability, whereas the highest rate was registered in the groups with moderate level of disabilities. The purpose of orthotic prescription is often to restore or improve walking abilities. In the group with the lowest FIM score functional ambulation is frequently unlikely to be achieved. On the other hand, patients in the group

with mild disabilities often restore adequate gait without using an orthosis.

CONCLUSION

Study results indicate that there are differences between age groups regarding the results of rehabilitation as well as the use of orthoses. At the end of the rehabilitation the best results were achieved in the youngest group of patients. The same group was also prescribed the highest rate of orthoses. But these two facts cannot be so simply connected, as the final result of rehabilitation is also influenced by many other factors which were not researched in the study. The analysis of orthotic use with a regard to the functional status illustrates a higher rate in the groups with moderate level of disability. The use of other rehabilitation devices is more equally spread within different age and functional groups. However, further studies into how and to what extent orthoses influence the final result of rehabilitation are needed.

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