Utilization of Orthotic Devices in Stroke Patients: A Comparison of Out-Reach and Institution Based Services

M.J.L. Sullivan, PhD; B. Heisel, PhD; E. Lemaire, MSc; G. Martel, M.HSc; and D. Grinnell, MD

The present study examined the extent to which stroke patients use their ankle-foot orthoses (AFOs). The study also compared the device utilization of patients who obtained their AFOs through an out-reach rehabilitation service and patients who obtained their AFOs through an institution based rehabilitation service. Overall, 80% of patients reported wearing their AFOs at least 7 hours per day. Hours of wear correlated significantly with patients’ age, perceived utility of the device, and patients’ activity level. Patients in the outreach group used their AFOs fewer hours per day, perceived their AFOs to be less useful, were older and less active than patients in the institution based group.

Many stroke patients experience ambulatory difficulties that can be improved with the use of assistive devices (Garrison, Rolak, Dodaro, & O’Callaghan, 1988). With the steady rise in the number of assistive devices prescribed to stroke patients, it becomes important to address the cost effectiveness of dispensing practices. A major factor contributing to the cost effectiveness of dispensing practices for assistive devices is the degree to which patients use their assistive devices (McGrath, Goodman, Cunningham, McDonald, Nichols, & Unruh, 1985).

Although there has been little research in this area, reports on the use of assistive devices in rehabilitation suggest that low rates of utilization are a significant problem (Caudrey & Seeger, 1983; Kaplan, Grynbaum, Rusk, Anastasia, & Gassler, 1966). Research indicates that more than one third of upper limb amputees do not use their prostheses at all, and more than 60% wear their prostheses less than 6 hours per day (Burrough & Brook, 1985; Wilson, 1970). Factors such as discomfort, patient training, lack of reliability, and appearance have been cited as device characteristics which may contribute to low rates of utilization (Burrough & Brook, 1985). There are indications that utilization of assistive devices may be higher in children than in older adults (Caudrey & Seeger, 1983; McGrath, et al., 1985).

The present study was designed to obtain preliminary information about the extent to which stroke patients use their ankle-foot-orthoses (AFOs). AFOs provide stability and support to the ankle and foot by reducing the range of motion of the ankle, and by placing the joint in an optimal orientation during gait (Lehmann, 1979). There are several different types of AFOs which vary with respect to their flexibility, weight, design, and cost of fabrication. The patients in this study received custom moulded non-articulated polypropylene AFOs.

The present study also compared AFO use between patients who had obtained their AFOs through an out-reach rehabilitation service (Terry Fox Mobile Clinic) with patients who had obtained their AFOs through an institution based rehabilitation service (The Rehabilitation Centre). The Terry Fox Mobile Clinic is an out-reach rehabilitation service operated by the Rehabilitation Centre in Ottawa, and provides services to rural communities in Eastern and North-Eastern

The authors thank K. Edgley, L. Nesculescu, M. Ekstrand, J. Nymark, S. Locke, J. MacDougall, and members of the Terry Fox Mobile Clinic for their contributions to this research. Portions of this paper were presented at the S.M. Dinsdale International Conference in Rehabilitation, Ottawa, 1990. This research was supported by the Royal Ottawa Health Care Group Foundation.
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Ontario, and Western Quebec. The Terry Fox Mobile Clinic is involved in the assessment of disabled individuals and in the prescription and dispensing of assistive devices. As a function of time constraints, patients seen through the Terry Fox Mobile Clinic receive only minimal instruction in the use of their AFOs. Patients who obtained their AFOs while inpatients at The Rehabilitation Centre received daily practice with the use of their AFOs over several weeks.

METHOD

Subjects

A total of 20 stroke patients who received AFOs between January 1988 and November 1988 participated in the research. The sample consisted of 10 patients drawn from the records of the Mobile Clinic and 10 patients drawn from the inpatient records of The Rehabilitation Centre. Patients were selected on the basis of having obtained their AFOs approximately one year prior to the study. The one year time frame was chosen to reduce the potential confounds associated with time-related changes in disability status. Demographic and medical information were drawn from medical records.

Of the total number of patients sampled (n = 26), 3 declined to participate, 2 were deceased, and 1 was unable to understand the interview questions. The mean age of the sample was 70 years with a range of 40 to 87 years. Patients had received their AFOs, on average, 11.4 months (range = 10 to 13 months) prior to the study. Sixteen patients were male and 4 were female. Twelve patients had right CVAs and 8 patients had left CVAs. Sixteen patients were living at home and 4 patients were living in a nursing home. There were no significant differences due to gender, site of CVA, or residence for any of the dependent variables.

Procedure

Patients were contacted by telephone and asked if they were willing to answer a few questions about their use of their AFOs. If the patients agreed to participate, a structured telephone interview was conducted. Patients were questioned about the number of hours per day that they wore their AFOs; the comfort level of their AFO (1 = very comfortable, 5 = very uncomfortable); the perceived utility of their AFO (1 = not at all useful, 5 = very useful), and whether they required assistance to put on their AFO. Patients were also asked to indicate (from a list read by the interviewer) the number of high and low mobility activities they engaged in on a daily basis. Low mobility activities included resting, reading, watching television, listening to the radio, and engaging in conversation. High mobility activities included going for a walk, visiting, cleaning, cooking, and shopping or other outings.

RESULTS

Overall, 80% (18/20) of patients reported wearing their AFOs at least 7 hours per day. Only one patient reported not using the AFO at all. None of the patients reported requiring assistance to put on their AFOs. The total number of hours of wear was inversely correlated with age, \( r(20) = -.51, p < .01 \), and positively correlated with perceived utility, \( r(20) = .47, p < .01 \), and positively correlated with the number of high mobility activities. \( r(20) = .38, p < .05 \).

As shown in Table 1, there were significant differences between the out-reach group and the institution based group on several variables. The out-reach group was significantly older, \( t(18) = 2.4, p < .05 \); reported wearing their AFOs fewer hours per day, \( t(18) = 2.3, p < .05 \); and considered their AFOs to be less useful, \( t(18) = 2.6, p < .05 \), than the institution based group. The out-reach group also reported engaging in fewer high mobility activities than the institution based group, \( t(18) = 2.8, p < .05 \). The two groups did not differ significantly with respect to perceived comfort, or number of low mobility activities.
TABLE 1
Comparison of Utilization Variables for Outreach and Institution Based Groups

<table>
<thead>
<tr>
<th>Variable</th>
<th>Patient Group</th>
<th></th>
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</thead>
<tbody>
<tr>
<td></td>
<td>Mobile Clinic</td>
<td>M</td>
<td>SD</td>
<td>M</td>
</tr>
<tr>
<td>Age (years)</td>
<td></td>
<td>72.0</td>
<td>6.6</td>
<td>65.0</td>
</tr>
<tr>
<td>Hours of wear</td>
<td></td>
<td>8.1</td>
<td>2.0</td>
<td>10.1</td>
</tr>
<tr>
<td>Perceived comfort (1 = very comfortable</td>
<td></td>
<td>2.1</td>
<td>1.2</td>
<td>1.8</td>
</tr>
<tr>
<td>5 = very uncomfortable)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Perceived utility (1 = not at all useful.</td>
<td></td>
<td>3.5</td>
<td>1.6</td>
<td>4.3</td>
</tr>
<tr>
<td>5 = very useful)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Number of high-mobility activities</td>
<td></td>
<td>1.3</td>
<td>1.3</td>
<td>3.0</td>
</tr>
<tr>
<td>(range = 0-5)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Number of low-mobility activities</td>
<td></td>
<td>3.7</td>
<td>1.3</td>
<td>4.3</td>
</tr>
<tr>
<td>(range = 0-5)</td>
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DISCUSSION

The results of the present study suggest that there is high utilization of orthotic devices in stroke patients. Across both groups, 80% of patients reported wearing their AFOs at least 7 hours per day. It is difficult to determine how representative these data are since there have been no previous reports on utilization of orthotic devices in stroke patients. However, the utilization reported in the present study is higher than that reported in studies examining utilization of prosthetic devices (Burrough & Brook, 1985).

It has been argued that treatment programs for chronic disorders have low adherence because they tend to be preventative in nature, require a high degree of behaviour change, and are not associated with apparent risk or immediate change (Meichenbaum & Turk, 1987). These concerns may not apply to the use of AFOs. AFOs require minimal effort to put on and are associated with a relatively immediate change in the ease of ambulation.

Although utilization was high in both the outreach and institution based groups, patients who received their AFOs through the out-reach service reported wearing their AFOs fewer hours per day than patients who received their AFOs through the institution based service. It is possible that institution based service is associated with greater utilization because patients have received more extensive training in the use of their device. However, the outreach group was older and reported being less active than the institution based group. These factors may have also contributed to lower utilization.

It is not possible to make firm conclusions about the factors that may be responsible for the differences in utilization between the out-reach and institution based services from this study. However, if the differences between the out-reach and institution based groups are related to differences in training, then utilization may be increased by providing patients with detailed written information about the use of their AFOs.
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Providing patients with written information about their treatment programs has been shown to increase treatment adherence in other areas of health care (Ley, 1986).

La présente étude examine à quel degré les patients ayant eu un accident vasculaire cérébral utilisent les orthèses pieds-chevilles. L'étude compare également l'utilisation de cet appareil chez les patients qui ont obtenu l'orthèse par l'intermédiaire d'un service d'extension d'une part, et chez ceux qui l'ont obtenue par le service de réadaptation d'une institution d'autre part. Dans l'ensemble, 80% des patients rapportent qu'ils portent leurs orthèses un minimum de 7 heures par jour. Il existe une corrélation significative entre la durée du port, l'âge du patient, la perception qu'il a de l'utilité de l'appareil, et le niveau d'activité du patient. Comparés aux patients relevant d'une institution, les patients des groupes d'extension portent leurs orthèses moins longtemps au cours de la journée: ils les estiment moins utiles, sont plus âgés et moins actifs.

REFERENCES


M.J.L. Sullivan, Associate Professor, Department of Psychology, Clinical Psychology Program, Dalhousie University, Halifax, Nova Scotia B3H 4J1, Canada.

B. Heisel, Department of Psychology, The Rehabilitation Centre, 505 Smyth Road, Ottawa. Ontario K1H 8M2, Canada.

E. Lemaire and G. Martel, Department of Prosthetics and Orthotics, The Rehabilitation Centre.

D. Grinnell, Department of Rehabilitation Medicine, The Rehabilitation Centre.

Please address correspondence or reprint requests to Dr. M.J.L. Sullivan at the address given above.