

Use and abandonment rates of assistive devices/orthoses in patients with stroke

İsmail SAFAZ (*), Hatice TÜRK (*), Evren YAŞAR (*), Rıdvan ALACA (*), Fatih TOK(**), İlknur TUĞCU (***),

SUMMARY

The aim of this study was to examine the use of assistive devices/orthoses in patients with stroke. The rates of orthotic prescription and abandonment, and the reasons of abandonment were investigated. One hundred and seven stroke patients, who had been rehabilitated in our hospital, were visited by two social service specialists and a questionnaire was applied to all patients. Mean elapsed time after stroke to evaluation time was 48.90 ± 23.49 months. Among subjects, 57.0% were prescribed a tripod or a tetrapod, and 26.2% were given a wheelchair. Overall, 39.3% of patients declared that they were not using their tripod/tetrapod and 28.6% were not using their wheelchair. Concerning upper limb orthoses, 22.4% of patients were given an inhibitor hand splint and 16.8% were given a neutral wrist splint. The abandonment rates were 70.8% and 77.8%, respectively. More than half of those subjects stopped using their orthoses. Regarding lower limb orthoses, 43.0% of patients were prescribed an ankle foot orthosis and 54.3% of them stopped using it. Significant amount of stroke patients seem to stop using their assistive device/orthoses despite their need. Further studies are warranted for better understanding the relevant causes.

Key words: Stroke, orthosis, abandonment

Introduction

Use of assistive device and orthosis in patients with stroke is an integral part of the rehabilitation program. They are often used in order to support patients' balance and ambulation, and also to reduce symptoms and prevent deformities. However, some studies revealed that a great portion of patients with stroke are not satisfied with their orthoses and that they stop using them (1,2). Performance of an orthosis is closely related to the abandonment. The compliance of the patient regarding the orthotic use is closely related with how much his/her expectations are fulfilled in terms of efficiency, reliability, durability, comfort and convenience (2,3).

There are limited number of studies on the use and abandonment of orthotics. These studies have focused on a wide spectrum of disorders and are mainly related with the consumer satisfaction (4,5). Some other studies have investigated patients' satisfaction with the orthoses which are made by new technologies (3,6,7), or the usage of a particular orthosis, i.e. shoes or ankle foot orthosis (AFO), in various diseases (1).

To our best knowledge, there is no comprehensive study concerning the use and abandonment of orthoses especially in patients with stroke. Accordingly, the aim of this study was to examine the use of assistive devices/orthoses in patients with stroke. The rate of orthosis prescription and abandonment, and the reasons of abandonment were also investigated.

Materials And Methods

Patients

One hundred and seven stroke patients who had been followed in our rehabilitation center between 2000-2007 were recruited. After reviewing the records of the patients, 304 of them who were residing in the same city with our center and who had been discharged at least one year ago were enrolled in the study. All patients were telephoned; 47 subjects had died, 14 had moved, 126 could not be reached and 10 did not accept the interview. Remaining 107 patients were visited at their homes by two social workers and they were asked to fill out the Orthotics Evaluation Form. All the patients provided informed consent and the study was approved by the local Institutional Review Board.

Orthotics Evaluation Form

This form was prepared to evaluate the usage of assistive devices and orthoses of the patients. Prescription of assistive devices (single-point cane, cane, tetrapod or tripod, walkers and wheelchairs), and orthosis of the upper extremity (shoulder strap, resting splint and inhibitors) and the lower extremity (resting mold, AFO, Knee Ankle Foot Orthosis (KAFO), orthopedic boots, metal knee-ankle foot orthosis and metal ankle

*Gulhane Military Medical Academy, Department of Physical Medicine and Rehabilitation, TAF Rehabilitation Center, Bilkent, Ankara, Turkey.

**İskenderun Marine Regiment Medical Center, İskenderun, Hatay, Turkey.

***İncek Physical Therapy And Rehabilitation Hospital.

Ayrı Basım İsteği: İsmail Safaz
Gulhane Military Medical Academy,
Department of Physical Medicine and Rehabilitation,
TAF Rehabilitation Center, Bilkent, Ankara, Turkey
e-mail: safazi@yahoo.com

Makalenin Geliş Tarihi: Dec 01, 2014 • Kabul Tarihi: Mar 16, 2015 • Çevrim İçi Basım Tarihi: 30 Haziran 2015

foot orthosis); whether or not they kept using their orthosis, if not the reason for not using it (own decision/medical advice) were questioned in the initial section. Orthoses that were not included in the list was also noted. Patients were also questioned with regard to ambulation (at discharge/current) and spasticity.

Patients who decided to abandon using the orthosis him/herself were asked to explain the reason in accordance with the following 8 options: “not comfortable”, “wearing is very difficult”, “the appearance is disturbing”, “causing pain”, “causing wound”, “I do not think that it is useful”, “I do not know why I am using”, “I do not know how to use it”.

Frequency analysis was performed regarding the rate of orthotics prescription and abandonment.

Results

Table 1 shows the demographic characteristics of patients. Prescription and abandonment rates are summarized in Table 2. Among patients who abandoned wheelchair, 37.5% (3 patients) did not have functional walking. Among patients who abandoned neutral wrist splint, inhibitor splint and AFO, spasti-

Table 1: Demographics of patients.		
Mean, standard deviation (range)		
Age (year)	65.08 ± 12.09 (23-88)	
Duration of stroke (month)	48.90 ± 23.49 (15-125)	
	n	%
Sex		
Male	60	56.1
Female	47	43.9
Type of stroke		
Ischemic	87	81.3
Hemorrhagic	20	18.7
Effected side		
Right	55	51.4
Left	51	47.7
Bilaterally	1	0.9

Table 2: Ratio of use and abandonment of assistive devices and orthoses

	Ratio of prescribing		Ratio of abandonment		Decision of abandonment			
	n	%	n	%	Him/herself		Medical person	
					n	%	n	%
Assistive device								
Single-point cane	14	13.1	1	7.1	1	100	-	-
Cane	7	6.5	2	28.6	2	100	-	-
Tripod-tetrapod	61	57.0	24	39.3	17	70.8	7	29.2
Walker	6	5.6	3	50	3	100	-	-
Wheelchair	28	26.2	8	28.6	7	87.5	1	12.5
Orthosis								
Shoulder strap	35	32.7	27	77.1	15	55.6	12	44.4
Resting splint	18	16.8	14	77.8	12	85.7	2	14.3
Inhibitor splint	24	22.4	17	70.8	15	88.2	2	11.8
Resting molt	3	2.8	0	0	-	-	-	-
AFO	46	43.0	25	54.3	17	68.0	8	32.0
KAFO	1	0.9	1	100	-	-	1	100
Orthopedic boot	6	5.6	4	66.7	3	75.0	1	25.0
Metal AFO	10	9.3	6	60.0	3	50.0	3	50.0
Metal KAFO	3	2.8	1	33.3	-	-	1	100

AFO: Ankle Foot Orthosis
KAFO: Knee Ankle Foot Orthosis

city was present in 35.7% (5 patients), 58.8% (10 patients) and 56% (14 patients), respectively.

Forty-four patients who abandoned orthotic use expressed the following reasons: “uncomfortable” (61.4%), “wearing was difficult” (27.3%), “appearance is disturbing” (18.2%), “causing pain” (29.5%), “causing wound” (13.6%), “I do not think it is useful” (54.5%), “I do not know why I am using it” (13.6%) and “I do not know how to use it” (6.8%).

Discussion

Tripod-tetrapod was prescribed to approximately 2/3, whe-

elchair was prescribed to 1/3 of the patients and one third of these patients reported that they stopped using the assistive devices later on. Inhibitor hand splint was prescribed to 1/3, neutral hand splint was prescribed to 1/5 of the patients and more than half of them abandoned their orthoses. Although AFO was prescribed to half of the patients, approximately half of those abandoned their AFO later on. Other lower extremity orthosis were prescribed less than AFO but their abandonment ratios were higher. Patients were found to have stopped their upper/lower limb orthoses despite the fact that their spasticity persisted or even increased.

The most important reason for orthosis abandonment se-

ems to be "being uncomfortable" in our study. Other reasons like "painful", "wearing is difficult", "disturbing appearance", "causing wound" followed in decreasing frequency. Approximately half of the patients believed that the orthosis was not useful. Herein, there could be two explanations; either the orthosis may really not be appropriate or the patient is unaware of what is expected from the orthotic use. Since 10% of the patients declared that they did not know the reason for their orthotic use, the latter hypothesis seems to be more likely.

In one study encompassing patients generally with rheumatic diseases, the level of patient dissatisfaction with various orthoses were reported as follows: AFO's 16%, footwear 24%, knee braces 42%. The most common reason for abandonment was weight, cosmesis, donning and doffing difficulties and functional uselessness (1). In other studies, it was reported that abandonment of KAFO use was even higher than other orthoses (3). In another study with 86 adult patients who had experienced stroke or orthopedic surgery, 47% either used their assistive devices rarely or never (8). Gitlin et al (9), in a survey of 13 disabled children, reported that 45% of children abandoned their assistive devices in the first month after discharge.

In 47 patients with stroke or spinal cord injury, Cushman et al (10) reported that 33% of them abandoned their assistive devices and orthoses 3 months after discharge. While 59% of the patients declared that their orthoses were no more necessary, 41% mentioned that they abandoned due to using difficulties and wrong prescription (10). Similarly, Neville-Jan et al (11) investigated the rates of use and abandonment of orthoses and assistive devices in various rehabilitation patients and they reported that 15% of the patients never used and 21% used their orthosis for a short time. Reasons for abandonment were declared as inapplicability, not know how to use the devices, no need to use, need to use for a short time, feeling unconfident, appearance was disturbing and did not enjoy their devices respectively (11).

In this study, we detected similar rates of abandonment of prescribed orthoses and assistive devices similar to literature. However, due to its cross-sectional design, properties of the orthoses and convenience for the patients were not investigated in our study. Furthermore, the lack of a validated questionnaire regarding patient satisfaction with orthotic use can be considered as the other limitation of this study.

In conclusion, because of several reasons, patients tend to abandon their assistive devices or orthoses despite their need. Those reasons need to be elucidated with future studies. Last but not least interdisciplinary approach for assistive device/orthoses and producing lighter, more qualified and more esthetic devices may decrease abandonment ratios.

Acknowledgment

We thank Pelin Cicos, social worker, for her help in data collection.

References

1. Fisher LR, McLellan DL. Questionnaire assessment of patient satisfaction with lower limb orthoses from a district hospital. *Prosthet Orthot Int*. 1989;13:29-35.
2. Phillips B, Zhao H. Predictors of assistive technology abandonment. *Assist Technol*. 1993;5:36-45.
3. Bernhardt KA, Irby SE, Kaufman KR. Consumer opinions of a stance control knee orthosis. *Prosthet Orthot Int*. 2006;30:246-56.
4. Geertzen JH, Gankema HG, Groothoff JW, Dijkstra PU. Consumer satisfaction in prosthetics and orthotics facilities. *Prosthet Orthot Int*. 2002;26:64-71.
5. Demers L, Weiss-Lambrou R, Ska B. Item analysis of the Quebec User Evaluation of Satisfaction with Assistive Technology (QUEST). *Assist Technol*. 2000;12:96-105.
6. Stroh Wuolle K, Van Doren CL, Bryden AM, Peckham PH, Keith MW, Kilgore KL, et al. Satisfaction with and usage of a hand neuroprosthesis. *Arch Phys Med Rehabil*. 1999;80:206-13.
7. Verza R, Carvalho ML, Battaglia MA, Uccelli MM. An interdisciplinary approach to evaluating the need for assistive technology reduces equipment abandonment. *Mult Scler* 2006;12:88-93.
8. Gitlin LN, Schemm RL, Landsberg L, Burgh D. Factors predicting assistive device use in the home by older people following rehabilitation. *J Aging Health*. 1996;8(4):554-75.
9. Gitlin LN, Levine R, Geiger C. Adaptive device use by older adults with mixed disabilities. *Arch Phys Med Rehabil*. 1993;74(2):149-52.
10. Cushman LA, Scherer MJ. Measuring the relationship of assistive technology use, functional status over time, and consumer-therapist perceptions of ATs. *Assist Technol*. 1996;8(2):103-9.
11. Neville-Jan A, Piersol C, Kielhofner G, Davis D. Adaptive Equipment: A Study of Utilization after Hospital Discharge. *Occup Ther in Health Care*. 1993;8(4):3-18.