

Study on the Usefulness of Lower Limb Orthosis In Spinal Cord Injury Patients

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In last two years, 31 lower limb orthosis were fitted. Dorsal level paraplegics have used orthosis for exercise purposes only, while lumbar level paraplegics have used for community level ambulation as well.

Spinal Cord Injury patients have been reported to be successful in ambulation with leg braces⁴. But there is high rate of non-usage of braces varied from 32 to 59% (2,5,7,8,9)

Age, level of injury, duration of injury and other physical features are important factors in determining the orthosis usage.

This study has been planned to determine the usefulness of orthosis in Spinal Cord Injured patients along with various physical and social factors in our situation.

Method & Material

In last two years (1990 & 1991), 31 lower limb orthosis were fitted in paraplegics for ambulation, who were admitted in Spinal unit of Department of Physical Medicine & Rehabilitation, K.G. Medical College, Lucknow. Detailed followup study was done including level of lesion, age, ambulation status and their response towards orthosis.

Rancho Los Amigos Hospital criteria (Hoffer et al 1973), Hussey and Stauffer (1973) for

functional level of ambulation were used for follow up regarding ambulation status i.e., community ambulation, house hold-ambulation, non functional ambulation (exercise ambulation) and non ambulation.

Observation

Out of 31 paraplegics, 3 cases were less than 20 years of age, while 21 cases were between 20-30 years age group with an average age of 24.19 years. 7 paraplegics of thoracic level were using KAFO for exercise purposes only (Table No.I). Mostly patients of T6 & T7 lesions were wheelchair dependent, for them the orthosis was used only for exercise ambulation. These 7 non-ambulators discontinued the use of the orthosis for ambulation within 6 months after fitting of the brace & only one patient of T10 lesion was using the orthosis for exercise ambulation (Table No. II).

Paraplegics (complete and incomplete) who were below L1 and L2 level, continued to use orthosis regularly for ambulation. They were using their orthosis for community ambulation as well.

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Non use of orthosis was not related to marital status, education level & employment status etc.

Discussion

From the follow up study, it was observed that higher frequency of non usage of Lower Limb orthosis in spinal cord injured patients.

Age, Level of injury and severity of SCI are the important factors in determining the ability of functional ambulation. Patients with injury above T12 level could hardly get functionally significant ambulation while injuries below L4 level could get better ambulation with those appliances. (2,8,9)

In the present follow-up study, lesions above T9 or higher have not used the orthosis for ambulation. The energy cost of ambulation for paraplegics is related to the level of the lesion, and is extremely high at the level higher than T12¹. This is probably the main reason why high level paraplegics are not able to use orthosis for ambulation continuously.

Nativig and MC Adam (1978) in their 10 years follow up study of 27 paraplegics with complete lesion (T1-T10) observed that 20 patients were able to climb 20 stairs with crutches and 19 patients were able to make 100 meters. It indicates that the patients were younger and their ambulation programme was much more extensive.

Coghlan et al (1980) observed that age, physical status and ADL level were related to the use of braces. The high energy expenditure of paraplegic ambulation does not allow elderly and sick patients to ambulate. They prefer wheel chair more than orthosis. It is more so practically difficult to bear and taking out orthosis for which mostly they are dependent on others.

In an another follow up study of past, the common reasons given by the paraplegics were that brace makes them too slow, too difficult to too unsafe (Coghlan et al 1980). In our situation patients having dorsal lesions do not prefer orthosis as it is too cumbersome and unsafe, hence prefer wheel chair for their ambulation (Table No.III).

The upright position prevents complications like osteoporosis, pressure sore, spasticity and urinary complications, Nativig and MC Adam (1978). For maintaining the upright posture paraplegics prefer a pair of posterior splints as it is easier to use and of light weight.

Present study has demonstrated that younger patients of lumber lesion prefer to use braces for ambulation while dorsal lesion and elderly paraplegics prefer wheel chair for their ambulation and ADL activities.

Table No. I: Status of Spinal Cord Injury versus Type of Brace.

Level of Injury	KAFO	AFO	Total
Thoracic Level	7	0	7
Lumbar Level	20	4	24
Total	27	4	31

Table No. II: Status of Ambulation

Ambulation	At the time of fitting of caliper	Follow up
Community Ambulation	4	4
House hold Ambulation	20	18
Exercise Ambulation	7	1

Table No.III: Reasons for non use of brace

- Unsafe	6
- Not practical	1
- Muscle spasm	2
- Other reasons	2

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