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Original Article

Demographic and clinical characteristics of patients with spinal cord injuries: Two years' experience at a tertiary rehabilitation center

Raikan Buyukavci, Semra Akturk, Yuksel Ersoy

Inonu University, Faculty of Medicine, Department of Physical Therapy and Rehabilitation, Malatya, Turkey

Abstract

Aim: We aim to define the demographic and clinical characteristics of patients with spinal cord injury (SCI) attending the rehabilitation clinic of a tertiary rehabilitation center during the last two years.

Material and Methods: Data of 24 SCI patients treated on an inpatient basis between January 2016 and January 2018 at our hospital were retrospectively evaluated. The age, gender, etiologic factor causing spinal cord injury, injury level, duration between admission to hospital and injury time, duration of hospital stay, and additional problems encountered during rehabilitation (pain, spasticity, compression wounds, and neurogenic bladder) of patients were recorded. The definition of spinal cord lesion was made according to the American Spinal Injury Association (ASIA) scale.

Results: Among 24 individuals with spinal cord injury, 62.5% were males (male: female ratio is 1.66 : 1). Mean age was 37.3±16 years. The mean duration of hospitalization was 45±16 days. Motor vehicle accidents and spinal cord operations were the main reasons for SCI. The most common neurological level of injury was between T10-12. Of all individuals, 63% had thoracic, 21% had lumbar and 16% had cervical lesions.

Conclusion: The mean age of the SCI population is increasing. Motor vehicle accidents and spinal cord operations constitute the majority of etiologic factors. The male-female ratio is reducing. Thoraco-lumbar injuries are more common than cervical injuries.

Keywords: Spinal Cord Injury; Demographics; Tertiary Rehabilitation Center.

INTRODUCTION

Spinal cord injury (SCI) is the injury of the spinal cord from the foramen magnum to the cauda equina which occurs as a result of variety reasons. As a result of injury, functions completed by the spinal cord experienced interruptions at levels distal to the injury. It is one of the most severe personal disasters that may occur and can change a person's life in a moment (1). Every year, about 40 million people worldwide suffer from SCI. Most of them are young men, typically aged from 20 to 35 years, although 1% of this population is children (2).

The epidemiologic and demographic characteristics of spinal cord injury vary according to region and time. In different regions and at different times, 8-21 cases per million population are reported in Turkey (3-4). Rehabilitation of SCI patients requires lifelong care and multidisciplinary rehabilitation dealing with related functional, physiological, social and economic problems. The aim of rehabilitation of SCI patients is to ensure it is possible for patients to return to daily life activities and rapidly regain physical strength. Determination of the ambulation potential and achievable functional targets for patients in the early period and reducing complications that may develop to a minimum are the primary aims.

Research related to the demographic and clinical characteristics of SCI ensures better understanding of the causes, risk factors, clinical results and complications of SCI and allows development of preventive strategies. In the literature there are a few current studies about the demographic traits and clinical characteristics of SCI in Turkey (5-6).

The aim of the study is to determine the demographic and clinical characteristics of patients monitored for spinal cord injury in a tertiary rehabilitation clinic in our region.

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Corresponding Author: Raikan Buyukavci, Inonu University, Faculty of Medicine, Department of Physical Therapy and Rehabilitation, Malatya, Turkey, E-mail: raikan.buyukavci@inonu.edu.tr

The study included 24 spinal cord injury patients rehabilitated as in-patients in the Physical Therapy and Rehabilitation clinic of Turgut Ozal Medical Center at Inonu University from January 2016 to January 2018. The study had retrospective design.

The demographics and clinical characteristics of the patients including the age, gender, etiologic factor causing spinal cord injury, injury level, functional status, period between admission to hospital and time of injury, duration of hospital stay, and additional problems encountered during rehabilitation (pain, spasticity, pressure sores, and neurogenic bladder) were recorded.

Definition of spinal cord lesion was according to the American Spinal Injury Association (ASIA) scale (7).

ASIA Impairment Scale (AIS)
A = Complete. No preserved sensory or motor functions in the S4-S5 sacral segments.

B = Sensory Incomplete. Sensory but not motor function preserve below the neurological level and including S4-S5 sacral segments (mild touching, needle prick or deep anal pressure at S4-S5), no motor functions preserved three levels below motor level in both halves of the body.

C = Motor Incomplete. Motor function preserved below neurological level and more than half of key muscles below single neurological injury level have muscle grade less than 3 (grade 0-2).

D = Motor Incomplete. Motor function preserved below neurological level and at least half (half or more) of key muscles below single neurological injury level have muscle grade ≥ 3.

E = Normal. Sensory and motor functions assessed as normal in all segments. If prior deficit was present in the patient, the AIS degree is E. Someone without spinal injury initially does not have an AIS degree.

The Statistical Package for the Social Sciences (SPSS) v. 18.0 for Windows was used for statistical analysis.

RESULTS

The mean age of 24 patients was 37.3±16 year (min 19 -max 72). Of patients, 62.5% were males (male:female (M/F) ratio 1.66/1). The duration between the injury causing patient's admission to the clinic for rehabilitation and admission to our ward was minimum 8 days and maximum 13 years. The mean hospital stay was 45±16 days (min 10 max 90).

When the etiology of injury is examined, the most common reasons were, in order, motor vehicle accidents (M/F: 5/4), spinal cord surgery (M/F: 5/2), fall from a height (M/F:4/2) and gunshot wound (M/F:1/1).

Four patients were tetraplegic (16%) (3 complete/1 incomplete lesion) and 20 patients were paraplegic (84%) (8 complete/ 12 incomplete lesions).

When the neurological injury level is examined, the distribution was identified as cervical/thoracic/lumbar 4/15/5.

The most common complications linked to spinal cord injury in patients were neuropathic pain (37.5%), spasticity (33.3%) and pressure sores (25%). The neurogenic bladder rate was 16 (66.6%) and 14 patients had clean interval catheterization and 2 patients had permanent catheter inserted due to urinary system infections.

DISCUSSION

This study includes demographics and clinical data of SCI patients admitted for SCI rehabilitation to a tertiary rehabilitation in our region in the last 2 years.

Previous studies in Turkey stated the mean age of SCI patients in Turkey was 30.6 to 35.5 years (3,4). A broad patient study in recent times identified the mean age as 38.3 years (6). In our patient group, similar to this study published in 2018, there was a slightly higher mean age (37.3 years).

The male patient ratio among our spinal cord injury patients is higher than women both in Turkey and globally. However, studies show that this ratio is reducing in data from our country (Tuğcu et al. 2011 (5)- male/female: 2.69/1; Taşoğlu et al. 2018 (6)- male/female: 2.31/1). In our patient group the total number of patients was low, and there was a reduction identified in the male/female ratio. The reason for this may be linked to socio-economic changes and cultural developments for women.

When etiologic factors are examined, motor vehicle accidents are first place in our country and in the world (6,8,9). In our patient group, motor vehicle accidents were identified at the highest rate in the etiology. Similarly, in accordance with the literature, fall from a height were in third place in the etiology. However, different from the literature, the rate with spinal cord surgeries (tumor) was high in our patient group. The reason for this may be the low number of total patients, active performance of spinal cord tumor operations in our hospital and our clinic giving priority to these patients.

In Turkey, especially in our region, there are limited numbers of clinics and beds for in-patient rehabilitation services. After acute interventions in the surgical clinic of patients with spinal cord injury, rehabilitation is assessed by physicians and their admission to rehabilitation clinics may be delayed for many reasons. Though there are a range of social causes like limited educational level of patients and incorrect direction of the patient by physicians, factors like low numbers of beds in rehabilitation clinics, long duration of hospital stays, and admission of SCI patients in the chronic period may be primarily listed. When our study results are examined, 1/3 of our patients were in acute period SCI, 1/3 were in subacute and 1/3 were in chronic period SCI patients. In Turkey, as in many countries, there is a need for centers with higher capacity to benefit SCI patients in the acute/ subacute period.

When older data from developed countries are examined,

it is reported that mainly C4 and C5 cervical injuries form the majority of SCI (50-75%) (10,11). It was identified that cervical injuries occurred after diving into water. In our small patient group, there was no patient injured by diving into water and in our whole patient group 16% were injured in the cervical region. The most commonly injured levels in studies in Turkey were shown to be T12 and L1 levels (4,6,12). It was identified that in our patient group, the lower thoracic vertebral levels were identified to be injured most (T10-12). It is thought-provoking that the most common cause among etiologic factors in thoracolumbar region injuries was traffic accidents. In developing countries like Turkey, the use of seatbelts is low and this situation causes an increase in thoracolumbar mortality instead of cervical lesions after motor vehicle accidents. The ASIA assessment of individuals with SCI in our study found the most common was ASIA A followed by ASIA D which complies with other regions of the world (5,10,11).

A range of complications observed in the acute and chronic periods among spinal cord injury patients significant affect the rehabilitation process and outcomes of patients. Pressure sores, spasticity, and pain are frequently encountered problems in the acute and chronic period in our clinic. The presence of these problems increases the patient's hospital stay and negatively affects our rehabilitation outcomes.

CONCLUSION

This study includes data of SCI patients treated at a tertiary rehabilitation center in our region. At this rehabilitation center, the mean age of the SCI population is increasing, with motor vehicle accidents still the most common etiologic factor. In recent years the male/female ratio in SCI is reducing and the thoracolumbar injuries are more common than cervical injuries. It is necessary to support interventions to develop access to rehabilitation in our region (both increasing bed capacity and increasing public awareness about rehabilitation) and to increase services given after discharge from rehabilitation.

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