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PREVELACNE OF PRESSURE ULCERS IN PATIENTS WITH SPINAL CORD INJURY; A RETROSPECTIVE STUDY

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ABSTRACT

INTRODUCTION

Pressure ulcers in patients with spinal cord injury (SCI) are associated with incredible financial cost and human sufferings. The aim of this retrospective study was to determine prevalence of pressure ulcers amongst patients with different levels of SCI.

METHODS

This retrospective study was conducted on 409 patients with SCI who were admitted to Paraplegic Centre Peshawar, Pakistan from January 2014 to July 2016. Data of the patients were accessed and information regarding demographics, physiological intactness of spinal cord injury, neurological level, occurrence of pressure ulcer, anatomical location of each pressure ulcer, severity of pressure ulcer and number of pressure ulcers were recorded.

RESULTS

The mean age of the participants were 33.7 ± 14.7 years. Majority of patients were male (77.8%) compared to their counterpart female population. More than half (60.4%) of the patients were married. A big proportion (43%) of the patients was uneducated. The most cited reason of the injury was fall from height (28.9%). Majority of the patients were having complete transaction of spinal cord (67.2%).A big proportion (63.8%) of patients admitted into the centre were having pressure ulcers. The highest percentage of pressure ulcers (72.8%) were found in complete tetraplegia. Majority of SCI patients were having multiple pressure ulcers (60. 9%).In more than half of the patients (56.3%) location of worst pressure ulcer was found to be sacrum-coccyx region and 58.6% patients were having Grade IV pressure ulcers.

CONCLUSION:

The Prevalence of PU is higher in our cohort as compared to other studies conducted in Pakistan, but large trials and prospective studies are required to truly determine the prevalence of PU in Pakistan. Early detection of PU should be a part of initial management of patients with SCI. Preventive strategies including patient and attendant education and education of health care professionals regarding PU are necessary to minimize burden of PU.

Key words

Pakistan, paraplegia, pressure ulcer, SCI, tetraplegia,

INTRODUCTION

Pressure ulcers (PU) are common and costly secondary complication associated with spinal cord injury(SCI) [(1)]. It has been reported to be one of the major contributing factors to morbidity and mortality in patients with SCI [(2)]. Research studies demonstrated significant costs and human sufferings due to development of PU in patients with lower mobility [(3)]. The most serious complication of a PU is septicemia which is a life-threatening condition[(4)].PU is a challenging problem for SCI patients, their attendants, and for therapists[(5)].

It is estimated that more than one-third of patients with SCI suffer from PU once in their lives[(6)]. PU occur in 25-30% of the SCI patients during the initial five years of their injury while the lifetime prevalence of PU in SCI patient is about 80%[(7)]. Annual prevalence of PU ranges from 10.2–38% (8-11). PU account for about one-fourth of the cost of care for SCI patients[(8)]. In general, prevention of PU is less costly than the treatment of the PU itself [(5)]. The incidence of SCI in developing countries is quite high yet data regarding PU in SCI patients in developing countries is lacking [(12)]. It has been reported that SCI epidemiology has distinctive

epidemiological features in a developing countries compared to developed countries [13]. This provides the need to provide data about SCI patients and their complications in developing countries like Pakistan.

In Pakistan, most of the data available about SCI patients and their complications was reported after 2005 earthquake. Tauqir et al. reported complications in SCI patients who sustained injury to spinal cord during 2005 earthquake in Pakistan. The study was conducted on 194 earthquake victims and it was reported that 20% SCI patients had developed PU[14]. In a prospective observational study Rathore et al. it was reported that 28.5% earthquake victims had developed PU[15].

To the best of authors' knowledge, only two surveys in Pakistan have reported data about PU in SCI patients[14,15]. The scope of these both studies was limited to those patients who have sustained injury to spinal cord during the earthquake. Moreover, the sample sizes of these studies were small. None of these studies described characteristics of PU in different SCI level. Therefore, this study was designed to determine prevalence of PU amongst patients with different SCI level who are coming to Paraplegic Centre Peshawar.

METHODS

This was a retrospective study which was conducted at Paraplegic Centre Peshawar. All patients with SCI, both male and female with all ages admitted to Paraplegic centre from January 2014 to July 2016 were included in this retrospective study. Before data collection, permission was taken from administration of Paraplegic centre. The data was collected by primary researcher from medical records of SCI patients. Data of 409 patients (admitted in the centre from January 2014 to July 2016) was accessed and information regarding demographics, physiological intactness of SCI (complete SCI/incomplete SCI), neurological level, anatomical location of each PU, severity of each PU and number of PU (single, multiple etc.) were recorded. Data was entered into SPSS version 20 and was analyzed. The American Spinal Injury Association (ASIA) classification system was used to classify injuries as complete (ASIA A) or incomplete (ASIA B, C, D or E). Patients having cervical SCI were defined as tetraplegic and patients having thoracic, lumbar or sacral SCI were defined as paraplegics. European Pressure Ulcer Advisory Panel (EPUAP) grading system was used for grading PU.

RESULTS

A total of 409 patients (318 (77.8%) male and 91(22.2%) female) with mean age 33.7 ± 14.7 years admitted to Paraplegic Centre, Peshawar from January 2014 to July 2016 were included in this study. Majority of the patients 247 (60.4%) were married while the rest 162 (39.6%) were single. Most of the patients 369 (90.2%) admitted to the centre were from Khyber Pakhtunkhwa while remaining 40 (9.8%) were form other provinces of the country. Less than a half 176 (43%) of the patients were uneducated while 233(57%) were having different levels of education (From primary level to PhD). By profession, most of the admitted patients were Laborer 118 (28.9%) while 291(71.1%) were having other professions. The most common causes of injury were fall from height118 (28.9%) and Road traffic accident 104 (25.4%) and other causes 187 (45.7%) of the injury.

A small number of 44 (10.8%) of the patients were having complete tetraplegia, 27 (6.6%) were having incomplete tetraplegia, 275 (67.2%) were having complete paraplegia, 54 (13.2%) were having incomplete paraplegia while the rest of patients 9 (2.2%) were having their neurology intact. Majority of the patients 319 (78.0%) were having ASIA Impairment scale A, 41 (10.0%) were graded B, 28 (6.8%) were graded C, 12 (2.9%) were graded D and 9 (2.2%) were graded E.

A total of 261 (63.8%) patients admitted to the centre were having PU while the remaining patient's skins were intact. The highest percentage of PU (72.8%) was found in complete tetraplegia. Lowest percentages of PU (55.6%) were found in incomplete tetraplegia and incomplete paraplegia (Table 1).

Out of 261 patients who had PU, 102 (39.1%) were having single PU while 159(60.9%) were having multiple PU. The highest percentages of multiple PU were found in complete tetraplegia (Table 2). In more than half of the patients (56.3%) location of the worst PU was found to be sacrum-coccyx region (Table 3). More than a half 153 (58.6%) patients were having Grade IV PU while 26 (10.0%), 39 (14.9%), 43 (16.5%) were having Grade I, Grade II and Grade III PU, respectively.

Table 1: Frequency of pressure ulcers among SCI patients

Spinal cord injury level	Pressure ulcer present	Pressure ulcer not present
Complete Tetraplegia	32 (72.8%)	12 (27.2%)
Incomplete Tetraplegia	15 (55.6%)	12 (44.4%)
Complete Paraplegia	183 (66.6%)	92 (33.4%)
Incomplete Paraplegia	30 (55.6%)	24 (44.4%)
Neurology intact	1 (11.1%)	8 (88.9%)

Table 2: Number of pressure ulcers among SCI patients

Spinal cord injury level	Single pressure ulcer	Multiple pressure ulcers
Complete Tetraplegia	10(31.2%)	22 (68.8%)
Incomplete Tetraplegia	7 (46.7%)	8 (53.3%)
Complete Paraplegia	72 (39.4%)	111 (60.6%)
Incomplete Paraplegia	12 (40.0%)	18 (60.0%)
Neurology intact	1 (100%)	0 (0.0%)

Table 3: Anatomical location of pressure ulcers

Sacrum/ Coccyx	147 (56.3%)
Gluteal	32 (12.3%)
Ischium	31 (11.9%)
Trochanters	36 (13.8%)
Ankle/ Feet	13 (5%)
Scapulae/Shoulder	2 (0.8%)

DISCUSSION

The aim of this study was to determine prevalence of PU among different SCI level patients during initial inpatient hospitalization and/or during their stay at home prior to admission to Paraplegic centre Peshawar, Pakistan. Data of SCI patients admitted to Paraplegic centre from January 2014 to July 2016 were reviewed. Majority of the patients admitted to paraplegic centre for rehabilitation were having PU. It was revealed that PU were more common among complete tetraplegic patients as compared to incomplete tetraplegic or paraplegic patients. Greater number of participants developed multiple PU before their admission to Paraplegic centre. In more than half patient's location of worst PU was found to be sacrum-coccyx region. Grade IV PU were more prevalent among SCI patients. In literature, studies which have reported information about PU in SCI patient in Pakistan were conducted by Tauqir et al.(14) Rathore et al. 2007(15) and Rathore et al.2008(13). All these three studies had small sample size and reported only incidence/ prevalence of PU. None of these studies described characteristics of PU in different SCI level patients. Current studies not only describe frequency of PU in different SCI level patients but also identifies different characteristics of PU in SCI patients e.g. location and grade of worst PU. Previous studies were conducted in 2005-08 while current study included SCI patients who admitted to Paraplegic centre from 2014 to 2016.

The majority of SCI patients admitted to paraplegic centre were young adult men. The commonest cause of injury was fall from height. Most of patients were married and uneducated. Majority of patients were having complete paraplegia. These results were consistent with results of survey conducted about epidemiology of traumatic SCI in Pakistan. In Pakistani society, female population are relatively safer compared to their counterpart male as majority of the former population are less exposed to outdoor dangers (13). However, the studies carried out on spinal cord injury in Pakistan showed that the number of female population was higher than male population (14, 15). The latter studies were carried out on patients who have sustained injury to their spinal cord during earthquake. As majority of the female population in the country are limited to inside homes, therefore, they were at a high risk of getting injury during the earth quake.

Previous studies conducted in Pakistan reported that 28.5% and 20% and 39.9% SCI patients were having PU (13-15). The results of current study showed that 63.8% of SCI patients admitted to paraplegic centre were having PU. This huge difference can be explained by the facts that in the previous studies selected sample size were small and they were 2 month retrospective, 3 month prospective and 1 year prospective study respectively. The first two studies were limited only to earthquake victims while the third study included traumatic SCI patients. Current study was conducted in a centre where most of the SCI patients are referred after their initial treatment and surgical interventions in other hospitals. In most hospitals of Pakistan, facilities regarding PU prevention are scarce. Lack of knowledge among Pakistani health care professionals regarding PU prevention have been reported by researchers(13). Secondly, due to lack of awareness in Pakistani society about rehabilitation, most patients visit paraplegic centre after developing PU. During their stay in homes, most patients develop PU. The highest percentage of PU (72.8%) were found in complete tetraplegia. Majority of complete tetraplegics need partial or full assistant in bed mobility and transfers and are therefore are more prone to PU as compared to paraplegics(16-19).

It has been reported that most frequent site for PU development in SCI patients was sacral/coccyx region(17). Results of the current study are similar to the finding of latter trail and 56.3% patients in our study were having sacral/coccyx PU.SCI patients kept in supine position for longer periods of time and using hard mattress are prone to develop PU(17). In Pakistan, due to non-availability of pressure-relief mattresses, hard mattresses are commonly used for all patients coming to hospitals for rehabilitation (13). More than half, (58.6%) patients admitted to paraplegic centre were having Grade IV PU. Delay in detection of early changes of skin can convert into severe Grade IV PU. Garber et al. also reported that Grade IV PU were more prevalent among SCI patients (20). In contrast, Tauqir et al. reported that only 3% patients had Grade IV PU(14). As the latter study was conducted in SCI patients after 2 month of injury therefore, most of the patients had not developed Grade IV PU. On the basis of interpretation of the results it is clear that PU is one of the major complications among SCI patients in Pakistan. As very few studies have been carried out in Pakistan therefore, researcher are strongly encouraged to conduct prospective studies in this area.

CONCLUSION

The prevalence of PU is higher in our cohort as compared to other studies conducted in Pakistan, but large trials and prospective studies are required to truly determine the prevalence of PU in Pakistan. Early detection of PU should be a part of initial management of patients with SCI. Preventive strategies including patients and

attendants education, and education of health care professionals regarding PU are necessary to minimize burden of PU.

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Aatik Arsh; Study concept and design, protocol writing, data collection, data analysis, manuscript writing, manuscript review
Haider Darain; Study concept and design, data collection, data analysis, manuscript writing, manuscript review
Syed Muhammad Ilyas; Study concept and design, data collection, data analysis, manuscript writing, manuscript review
Amir Zeb; Study concept and design, data collection, data analysis, manuscript writing, manuscript review