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Original Article

Quality of Life in Spinal Cord Injury: Experience at a Military Tertiary Care Hospital

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ABSTRACT

Background: Spinal Cord Injury can have devastating consequences on an individual's physical and social capabilities. There is a scarcity of studies in Pakistan which identify the factors having a favorable and unfavorable effect on Quality of Life.

Objective: Determine the mean satisfaction score using Quality of life and Visual Analogue Scale scores in patients with Spinal Cord Injury.

Methods: The study was carried out for 6 months at the Armed Forces Institute of Rehabilitation Medicine (AFIRM), Rawalpindi. Total of 60 patients of SCI, both male and female were recruited by consecutive (non-probability) sampling. Quality of life and Visual Analogue Scale were measured using the Euro Quality o flife questionnaire. Data was analyzed using SPSS 17.

Results: The cross sectional descriptive study included 60 patients 49 (81.7%) males and 11 (18.3%) females. The average age in the study group was 32.37 ± 10 years. The mean duration of injury was 11.5 months ± 5.18. Employment status, level of education and duration of injury had moderately significant ($p<0.05$) effect while type of injury had a highly significant ($p<0.01$) effect on Quality of life and in Spinal cord injury patients. Age, marital status and gender did not have any significant influence on QoL in these patients. VAS score was significantly higher ($p=0.002$) in SCI patients with incomplete injury as compared to those with complete injury.

Conclusion: Spinal cord injury rehabilitation greatly impacts outcome scores. Patient satisfaction can be improved by educating and guiding the patient . Standardized tools need to be used to measure rehab outcomes.

Keywords: EQ- 5 D, Visual Analogue Scale, quality of life, spinal cord injury, Pakistan, Tertiary care

Introduction

Spinal Cord Injury (SCI) can have devastating consequences on an individual's physical and social capabilities, including loss of the ability to walk, paralysis of the arms or legs, loss of bladder and bowel control and loss of sexual function. In an international study conducted on QoL of SCI patients, the mean QoL score was 0.18 with mean SD 0.31.[1]

Since the life span of these individuals is starting to approach that of the non- injured, quality of life (QoL) has become an important concern.[2] Better QoL is both, the ultimate goal after rehabilitation following SCI and a key outcome to be used in determining the effectiveness of a rehabilitation program.[3]

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Studying QoL in SCI population has received little attention, but it has become a necessary and useful tool to evaluate the effectiveness and efficiency of health care interventions. Thus emphasis must be laid on using QoL as an outcome parameter after initial rehabilitation and in follow up programs developed for persons with SCI. Since quantifying QoL relies maximally on the person's perceptions, therefore, it must be kept in mind that the transition, from living in a state of independent functioning to dependency, will require the patient to re define his personal, social and vocational goals[4]. Better QoL is both, the ultimate goal after rehabilitation following SCI and a key outcome to be used in determining the effectiveness of a rehabilitation program.[3] However, due to the number of variables involved, defining and measuring QoL

remains difficult therefore, it is generally described as a quantifiable estimation of happiness and satisfaction with those aspects of life, which are important to the specific individual[5]. These aspects vary from person to person, depending on an individual's previous physical, mental and social environment and the expectations he might have for his future.

In Pakistan, very few studies have been conducted regarding SCI or QoL, since few centers in the country provide dedicated services for this ailment and focus on an individual's potential to lead a satisfactory life, after he has been disabled[6]. Hence, objective of the study was to determine the quality of life (QoL) score in patients with SCI based on the Euro QOL questionnaire.

Material &Methods

The cross-sectional descriptive study was carried out at Armed Forces Institute of Rehabilitation Medicine, Rawalpindi, Pakistan for a period of 6 months. A total of 60 SCI patients were included in the study using the consecutive (non-probability) sampling technique. Spinal cord injury was defined as Any injury or insult to the spinal cord, demonstrated on MRI with the following clinical signs namely weakness in muscles below the level of injury and impairment of sensory perception of soft touch and pin prick below the level of injury. It was further divided into complete SCI in which there is no preservation of any sensory or motor modality below the level of injury and incomplete Spinal Cord Injury in which there is some preservation of sensory or motor modality below the level of the injury according to the ASIA classification. Patients of all ages and both genders suffering from both traumatic and non-traumatic SCI were included in the study. The patients with a documented head injury or cognitive deficits or with other chronic debilitating diseases, e.g. cardiac, metabolic or neurological in nature were excluded.

Hospital Ethical Committee approval was taken for the study protocol and informed consent was taken from each patient. The demographic characteristics were noted. Euro QoL Performa was filled out during the interview/ examination of the patient by the trainee researcher. Scores in the Euro QoL proforma were then interpreted according to the list of values for different health states. SPSS version 17 was used for the statistical analysis. Mean and Standard Deviation were used to describe numerical variables like age, satisfaction (QoL) score. The socio-demographic data was analysed through descriptive statistics measuring frequencies and percentages. Mean satisfaction (QoL) score was calculated based on gender, duration of injury, educational status, occupation, marital status, completeness of injury and etiology. Bivariate analysis including Student's *t*-test was done to compare QoL in SCI patients with respect to demographics. One-way analysis of variance was applied to compare means of variables subdivided into more than 2 groups. A *p*-value <0.05 was considered significant.

Results

Total 60 patients 49 (81.7%) males and 11 (18.3%) females were included in the study. The mean age in males is 32.31 ± 10 years and the mean age in females is 32.64 ± 13 years. Demographics are shown in Table-1.

Table -1: Demographics of the patients (n=60)

Demographic Characteristics	Patients
Gendern (%)	
Male	49 (81.7)
Female	11 (18.3)
Mean age (yrs)	
Male	32.31 ± 10
Female	32.64 ± 13
Marital Status n (%)	
Unmarried	14 (23)
Married	46 (77)
Type of SCI n (%)	
Complete injury	43 (72)
Incomplete injury	17 (28)
Nature of Injury n (%)	
Traumatic Injury	51 (85)
Non-Traumatic Injury	9 (15)
Mean QoL (satisfaction)	
Male	0.465 ± 0.316
Female	0.350 ± 5.59
Mean VAS Score	
Male	56.59 ± 21.7
Female	51.36 ± 18

SCI=Spinal cord injury; VAS=Visual Analogue Scale, QoL=Quality of Life

The mean QoL in males is 0.465 ± 0.316and in females it is 0.350 ± 0.245. The mean QoL in total population is 0.444 +/- 0.306. The mean Visual Analogue Scale score in females is 51.36 ± 18.0 and in males is 56.59 ± 21.7. The mean Vas score in total population is 55.63 ± 21.0. The mean duration of injury was 11.5 months ± 5.18. The minimum duration of injury was 3 months and the maximum 24 months.

Out of the total sample of 60 patients, 3 (5%) fell between 10-19 years of age, 27 (45%) between 20-29 years, 18 (30%) between 30–39 years, 8 (13.3%) between 40-49 years, 1 (1.7%) between 50-59 years and 3 (5%) between 60-69 years of age. As far as educational status is concerned 3 (5%) were completely uneducated 13 (21.7%) were educated up till middle, 29 (48.3%) were matriculate,10 (16.7%) had passed their intermediate exams and 5 (8.3%) patients had received higher education. Comparison of QoL by demographic characteristics in the study group (n=60) is shown in Table-2.

Table 2: Comparison of QoL by demographic characteristics in the study group (n=60)

	Demographic Characteristics		
	Male n=49	**Female** n=11	p-value
QoL (mean±SD)	0.465 ± 0.316	0.350 ± 0.245	0.26
	Unmarried	**Married**	
QoL (mean±SD)	0.409 ± 0.355	0.454 ± 0.292	0.6
	Complete Injury	**Incomplete Injury**	
QoL (mean±SD)	0.376 ± 0.309	0.614 ± 0.227	0.005**
	Traumatic Injury	**Non-traumatic Injury**	
QoL (mean±SD)	0.468 ± 0.308	0.306 ± 0.269	0.14
	Unemployed	**Employed**	
QoL (mean±SD)	0.313 ± 0.286	0.504 ±0.299	0.02*

QoL=Quality of life; SD=Standard Deviation. $p<0.05$*; $p<0.01$** (Student's t-test)

QoL in different age groups is shown in Fig-1. Type of injury and employment status had significant influence on QoL in SCI patients ($p<0.05$) (Table-1). The effect on SCI due to age and marital status however remained insignificant ($p>0.05$). Educational status and duration of injury significantly affected the QoL in SCI patients as shown in Fig-2 and Fig-3 respectively. The mean Visual Analogue Scale score for patients suffering from a complete spinal cord injury was significantly lower (mean± SD 50 ± 19) as compared to patients suffering from incomplete spinal cord injury it was found to be 71 ± 17 ($p=0.002$).

Discussion

Spinal cord injury was described in the infamous Edwin Smith Papyrus[7] as an ' ailment not to be treated'. With the advancement of medical science this concept has now changed and people with spinal cord injury now live much longer and fuller lives.[8] Satisfaction with life is difficult to measure. It relies on quality of life scales which quantify this aspect. Euro QoL group developed the EQ-5-D Performa for this purpose.

In our study, we included a total of 60 patients. Out of these 49 (81.7 %) were males and 11 (18.3 %) were females thus the majority of patients were males. This is not so different from other studies as the National Spinal Cord Injury Statistical Center (NSCISC) database has noted that spinal cord injury occurs in males much more than in females, at a ratio of 4:1. The mean age in our study came out to be 32.37 years which is again almost the same as for NSCISC data, where the average age for spinal cord injury patients was 32.1 years[9]. The mean quality of life (QoL) in our study came out to be 0.444, which is considerably higher than that by Manca who found this to be 0.18[1]. This major difference is likely due to the fact that he quoted QoL of patients who had not yet undergone full rehabilitation, whereas our study included both, newly injured patients and those who had undergone rehabilitation. However, Barrera-Chacon while carrying out a study in Spain noted that patients with spinal cord injury had a mean QoL score of 0.26 before rehabilitation and 0.62 after rehabilitation, the average of which comes to 0.44 which is almost the same as what we found in our study. Also the mean VAS score in our study is 55.63 and that in their study is 54.19[10]. the probable reason for this is that patients of spinal cord injury who undergo a rehabilitation program at a specialized centre like the Armed Forces Institute of Rehabilitation Medicine, have life satisfaction scores comparable with the modern world.

45% of our patients were between 20 to 29 years of age, while 30% were between 30 to 39 years. The age group between 20 and 39, thus had 75 %of the people. This is because most of our patients were young Army soldiers who had been injured while fighting in operational areas. Moreover, the NSCISC database notes that 60% of all patients suffering from spinal cord injury are less than 30 years old[9]. This again correlates well with our study. 85% of the patients in this study suffered from traumatic spinal cord injury, out of which 86% were males. Among these males, the majority were military personnel. Although percentage of traumatic spinal cord injury is higher

throughout the world, but the overwhelming majority in our study, again, is a contribution from the injuries suffered by soldiers during war operations.

According to the NSCISC data, about 46% of the patients whose spinal cord was injured, had a neurologically complete injury that is American Spinal Injury Association scale 'A'.[9] In our study, 71% of the patients had suffered from a complete injury. This significant difference is again explained by the fact that most of the patients in this study were military personnel, who had sustained injuries in a war situation, thus causing serious damage to the spinal cord. 6 months or more had passed since suffering a spinal cord injury for 93.3% of our patients. This factor had an impact on the results since it allowed for a larger number of patients to undergo a rehabilitation program. This can help explain the higher visual analogue scale and quality of life scores in our patients compared with some other studies as mentioned in the preceding paragraphs.

Educational status plays a very important role in determining the outcome of such debilitating injuries[11]. Individuals with better understanding and analytical abilities are generally though to cope better with disability. In our study the mean scores for quality of life increase with better education. The anomaly arises in the higher educated section where scores were found to be low. This is explained by the fact that most of the high educated persons were females and some were even unemployed, who otherwise had lower satisfaction scores. Employed persons have overall better satisfaction levels than unemployed individuals. Such people are also more likely to return to their workplace.[12] In our study those persons who were employed fared much better than unemployed ones.

Age and marital status did not have any statistically significant influence on the QoL. This is in agreement with a study carried out previously on affected soldiers in India[13].Contrary to the common belief that QoL is better in married individuals.[14] The probable reason for it not to be true for our study subjects might be that the soldiers being in the Army spend a lot of time away from their families and spouses leading to less emotional bonding and dependency. Moreover, the provision of excellent support services in the rehabilitation centers also reduces their dependency on the spouse for emotional stability.

Study Limitations

The majority of patients in our study were military personnel who had been injured in war due to physical trauma. The higher QoL scores in this study also occur due to the fact that soldiers are trained to present a higher level of morale than what would be prevailing at that time. Other individuals would not follow this protocol and therefore might present with lower scores. The fact that Euro QoL has created these value sets for European countries and the Western world, also means that we are comparing our satisfaction scores with individuals from these countries. A small sample size remains a limitation in our study therefore future multicenter studies with a larger sample size should be performed.

Conclusion

Spinal cord injury rehabilitation greatly impacts outcome scores. Patient satisfaction can be improved by educating and guiding the patient. Standardized tools need to be used to measure rehab outcomes to provide tangible evidence for future reference. Patient's own level of education, injury duration and type also affects the outcome.

Future Recommendations:

1. Spinal cord injury management must be emphasized upon during undergraduate and especially post graduate studies.
2. All medical practitioners should be made aware about the ASIA scoring system.
3. Rehabilitation centers, with dedicated spinal units should be established atleast in the major cities of the country.
4. Quality of life measurement and its application should be taught and its use should be promoted within the hospital set up.

Main Messages:-

1. Provision of additional support and lifestyle interventions in spinal cord injury patients can improve their quality of life.
2. Age and marital status do not have significant effect on the quality of life in spinal cord injury patients.
3. Employment status, level of education and duration of injury had considerable effect on QoL in SCI patients.

Research Questions:-

1. Do ethnic variations affect the quality of life score in spinal cord injury patients.
2. Can QoL score be used as a tool to measure the efficacy of the treatment programs?
3. Can QoL score be used as a tool to measure the efficacy of the rehabilitation programs?

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D. Manuscript Writing
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