



## Quality of Life in Spinal Cord Injured patients with Neurogenic Bladder

### KEYWORDS

Urinary Incontinence, Paraplegia, Quadriplegia, Hygiene

**Davis Joseph Paracka**

MBBS, DPMR, MD (PMR), Formerly, Junior Resident,  
Dept. of Physical Medicine & Rehabilitation,  
Government Medical College, Trivandrum - 695011

**Vinay Goyal\***

MBBS, DPMR, DNB (PMR), Assistant Professor(PMR),  
Department of Physical Medicine & Rehabilitation, All  
India Institute of Physical Medicine & Rehabilitation  
Mahalaxmi, Mumbai -34 \*Corresponding Author

**Sreedevi Menon P**

MBBS, DPMR, DNB (PMR), Professor & Head ,Dept. of Physical Medicine & Rehabilitation, Government  
Medical College, Calicut - 673008

### ABSTRACT

**Background :** Neurogenic bladder pose a physical, social and emotional challenge to SCI patients . This study was planned to evaluate effect of neurogenic bladder on Quality of life in such patients.

**Aim :** The present study was designed to study different bladder management, compliance to them and evaluate the relationships between different bladder management and quality of life in patients with SCI.

**Material & Method :** Descriptive cross sectional study was conducted in spinal injury patients with neurogenic bladder. Incontinence Impact Questionnaire (IIQ-7) was used for assessment after taking informed written consent.

**Results :** Self Intermittent Clean Catheterization ( SICC) combined with condom or voiding technique was most common seen in 33.3 % patients followed by SICC and Indwelling Catheter . Majority (66.7%) of the study population had poor to very poor Quality of life according to IIQ-7 scores. Mean IIQ score was  $68.77 \pm 16.75$  in quadriplegics and  $57.93 \pm 18.75$  in paraplegics. Difference in IIQ scores between the two was not statistically significant ( $P=0.083$ ).

**Conclusion :** The present study showed that quality of life observed was poor to fair in spinal cord injured patients with neurogenic bladder irrespective of level of injury.

### Introduction

Spinal Cord Injury (SCI) patients experience considerable physical changes like impaired bladder and bowel that effects their quality of life. An earlier study revealed that 81% of participants with a SCI suffered from various degrees of bladder dysfunction 1 year post injury.<sup>1</sup> Neurogenic Bladder is a problem in which a person lacks bladder control.

SCI patients with bladder problems often had a low quality of life.<sup>2</sup> Decreased quality of life in SCI patients with neurogenic bladder occurs as result of various medical and social problems. Neurogenic bladder patients are at increased risk of UTI, autonomic dysreflexia, pressure ulcers & other complications.<sup>3,4</sup> Bladder management program may be tedious and time consuming for both patients & caregivers and may result in stress affecting social relationships and emotional health<sup>1</sup>.

The objective of bladder management is to ensure low pressure storage and emptying at will. Wyndaele et al.<sup>5</sup> reported that conservative treatment is the mainstay of bladder management in patients with SCI. Weld and Dmochowski<sup>6</sup> inferred that inappropriate selection of a bladder management method may affect patient's quality of life. Therefore it is important to further explore the influence that different methods of bladder management have on quality of life post SCI.

The present study was designed to study different bladder management, compliance to them and evaluate the relationships between different bladder management and quality of life in patients with SCI using Incontinence Impact Questionnaire (IIQ-7)<sup>7</sup>.

### Material and Methods

#### Participants

Ethical approval was granted by Research and Ethical Committee of institution. The study was done in Dept. of Physical Medicine &

Rehabilitation, Govt. Medical College, Trivandrum. from June 2009 to December 2010 Prior to enrolment each patient was given an information sheet explaining the procedure, the objectives and a consent form. The principal inclusion criteria were (1) Spinal cord injury of more than one year duration either due to traumatic or non-traumatic causes such as compressive myelopathy, benign spinal tumours, transverse myelitis (2) Definite diagnosis of Neurogenic Bladder (3) Patients who have undergone bladder rehabilitation previously in the PMR Department. The following reasons were considered as grounds for exclusion: (1) Spinal Cord Injury of less than one year duration (2) Spinal Cord Injury with concomitant brain injury and cognitive impairment (3) Spinal Cord Injury due to malignancies

- The patients who met the criteria were enrolled and evaluated using the questionnaire. The questionnaire was structured so as to evaluate a variety of data which included demographic data, diagnosis and inpatient rehabilitation measures obtained, present method of Bladder management, open & closed structured questions regarding the compliance to the bladder and Incontinence Impact Questionnaire (IIQ-7) scores to evaluate the effect of the current bladder status on quality of life.

- IIQ:** IIQ is a commonly used valid questionnaire which measures the changes in quality of life with regards to accidental urine loss. This questionnaire has been adapted to study population with neurogenic bladder. Hence it was an attempt to study the effect of not only urinary leaks, but also other parameters regarding bladder function on the quality of life. IIQ consists of 7 Items, each referring to a particular area of life that might be affected by the current problem. Items 1 & 2 refer to physical activities, 3 & 4 refers to travel. Item 5 studies social relationships and Items 6 & 7 refers to emotional health. Responses are assigned values of 0 for not at all, 1 for "slightly," 2 for "moderately," and 3 for "greatly." The average score of items responded to is calculated. The average,

which ranges from 0 to 3, is multiplied by 33 1/3 to put scores on a scale of 0 to 100.

- 0 – 25 = Good
- 26 – 50 = Fair
- 51 – 75 = Poor
- 76 – 100 = Very poor

**Statistical Analysis**

The data collected using the questionnaire was entered in Microsoft Office excel 2007 and analyzed using Statistic Package for Social Sciences (SPSS). Independent - Samples t- Test and One Way ANOVA (Analysis of Variance) were used to compare the means. To elucidate the associations and comparisons between different parameters, Chi square ( $\chi^2$ ) test was used as nonparametric test. Multivariate Linear Regression was used to compare different independent variables with the outcome variable.

**Results**

A total of 42 patients with a mean age of 37.6 years agreed to participate in this study. Four patients refused to join because of personal reasons (participation rate was nearly 91.3%). The background characteristics of the participants are presented in Table 1. Majority of patients were adults (90.47%) in age group of 20-59 years with a male predominance of 6:1. Manual Labourers comprised most common group (52.38%) with Traumatic Paraplegia as most common diagnosis in 57.1% of individual.

**Table 1**

Demographic and Clinical Characteristics of Patients N= 42	
Age Group	Number
< 20yrs	4
20-39yrs	15
40-59yrs	23
<b>Sex Ratio (M:F)</b>	6: 1 (M:F)
OCCUPATION	Frequency
Manual labourer	22
Skilled	7
Unskilled	4
Student	3
Unemployed	6
DIAGNOSIS	Frequency
Traumatic quadriplegia	12
Nontraumatic quadriplegia	1
Traumatic paraplegia	24
Nontraumatic paraplegia	5
DURATION	Frequency
<2yrs	26
2-4yrs	12
4-6yrs	2
>6yrs	2

Neurogenic bladder type and management technique are shown in Table 2 & 3. UMN type of neurogenic bladder was seen in 61.9% followed by LMN in 26.2%. as per classification based on location of the neurologic lesion. Combination of Self Intermittent Clean Catheterization (SICC) with condom or voiding technique was most common seen in 33.3% patients followed by SICC and Indwelling Catheter seen in 23.8% and 21.4% patients respectively.

**Table 2 Neurogenic Bladder Classification**

TYPE	Frequency	Percent
UMN	26	61.9
LMN	11	26.2
MIXED A	4	9.5
MIXED B	1	2.4

**Table 3 Bladder Management Techniques**

Bladder Mgt	Frequency	Percent
SICC	10	23.8
Caregiver .ICC	6	14.3
Indwelling catheter	9	21.4
Suprapubic catheter	3	7.1
Combination (SICC+ Condom, SICC + Voiding technique)	14	33.3
<b>Total</b>	<b>42</b>	<b>100.0</b>

Compliance to bladder rehabilitation practices in patients on ICC and continuous catheter is shown in Table 4 & 5. Out of the 30 patients doing ICC, 5 (17%) were not following the drinking voiding schedule or fluid restrictions. Most (70%) were not maintaining bladder diary. All the subjects conducted the procedure in clean manner and maintained perineal hygiene.

**Table 4 Compliance to bladder rehabilitation practices in patients doing ICC (n=30)**

COMPLIANCE	YES	NO
Following drinking-voiding schedule	25 (83%)	5 (17%)
Maintaining bladder diary	9 (30%)	21(70%)
Washing hands before ICC	30 (100%)	0
Cleaning catheter after each ICC	30 (100%)	0
Maintaining perineal hygiene	30 (100%)	0

**Table 5 Compliance to bladder rehabilitation practices in patients on Continuous Catheter (n= 12)**

COMPLIANCE	YES	NO
Adequate fluid $\geq$ 2 litres /day	10 (83.33%)	2 ( 16.66%)
Maintaining bladder diary	8 ( 66.66%)	4 (33.33%)
Taping of catheter tube	6 (50%)	6 (50%)
Perineal hygiene	12	0
Timely Change of Catheter	12	0

Out of the 12 patients on continuous drainage, 2 (16.66%) were not taking adequate fluid. One third of patients were not maintaining bladder diary and half of them (50%) were not positioning catheter well. All the subjects were maintaining perineal hygiene and did timely change of catheter.

IIQ scores observed are given in Table 6, 7 & 8. Majority (66.7%) of the study population had poor to very poor Quality of life according to IIQ-7 scores. None of them had Good Quality of life. Patients on indwelling catheter (Foley's/ suprapubic) had a higher score (poorer quality of life) than those on ICC (self/caregiver). Mean IIQ score was  $68.77 \pm 16.75$  in quadriplegics and  $57.93 \pm 18.75$  in paraplegics. Difference in IIQ scores was not statistically significant ( $P=0.083$ ).

**Table 6 Incontinence Impact Questionnaire Scores**

IIQ Category	Frequency	Percent
Good	0	0
fair	14	33.3
poor	12	28.6
very poor	16	38.1
<b>Total</b>	<b>42</b>	<b>100.0</b>

**Table 7** Type of bladder management and IIQ Scores

TYPE OF MANAGEMENT	BLADDER IIQ SCORE		
	fair	poor	very poor
SICC	4	6	0
Caregiver ICC	4	2	0
Indwelling catheter	0	2	7
Suprapubic catheter	0	0	3
combination	6	2	6

**Table 8** Mean IIQ Scores among Quadriplegics and Paraplegics

Diagnosis	N	Mean	Std. Deviation	Std. Error Mean
quadriplegia	13	68.77	16.759	4.648
paraplegia	29	57.93	18.796	3.490

### Discussion

Health related quality of life has been defined as the "functional effect of an illness and its consequent therapy upon a patient, as perceived by the patient"<sup>8</sup>. IIQ-7 is a 7 item non disease specific scale designed to evaluate the impact of urinary incontinence across domains of emotional health, physical activity and social health<sup>7</sup>.

In our study most of patients were adult males presenting with traumatic paraplegia. Similar demography was observed in a study by Roop Singh et al<sup>9</sup> and Liu et al<sup>10</sup>. Our study observed that 62% had UMN type bladder followed by 26% with LMN type neurogenic bladder. Among the 42 patients 24(57%) were doing SICC. Out of these 24 patients, 14 combined other techniques with SICC, which included mainly, using voiding techniques and condom drainage. Similarly Jugindro et al<sup>11</sup> in their study found that 63.33% have UMN type of neurogenic bladder and 36.66% have LMN type of neurogenic bladder

Study on compliance to components of bladder rehabilitation programme showed maintenance of bladder diary was better in SICC (66.66%) vs Indwelling group (30%). Good compliance was seen with drinking schedule, self hygiene and catheter cleaning methods.

No one in study group had good IIQ score (0-25), poor and very poor scores were seen in 28.6% and 38.1% patients respectively with fair scores observed only in one third of patients. This score showed that most of the patients had poor quality of life with regard to bladder dysfunction. Seung et al<sup>8</sup> and Derek et al<sup>12</sup> found lower quality of life in patients with neurogenic bladder. Tapia et al<sup>13</sup> in a systemic review concluded that patients with Urinary Incontinence had lower quality of life as compared to those without urinary incontinence.

IIQ scores in paraplegics and quadriplegics did not show any significant difference (p value .084) which meant no significant difference in quality of life among these two groups. Ninni Westgren et al<sup>12</sup> in their study and Denise G et al<sup>14</sup> in a review article had similar observations and concluded no significant difference in quality of life depending on level of injury in spinal cord injured patients.

Among the various bladder management methods, IIQ scores was found to be least among patients doing SICC and highest among patients on suprapubic catheter (p value .015). Liu et al<sup>10</sup> in their study on spinal injury patients found that patients with Self ICC had least Incontinence Impact on King's Health Questionnaire. This is probably because most of the cases selected for suprapubic catheterisation were those either having a urogenital fistula or having quadriplegia with poor upper limb functions.

It has been recommended that choice of bladder management should include a consideration of many factors such as age, patient preference, financial concerns, functional status and patient motivation. The present study shows that quality of life should also be an important consideration.

### Limitations of study:

It was cross sectional study with small sample size so findings of

study cannot be generalized. Also, IIQ-7 is not specific for spinal cord injury patients.

### Conclusion

The present study showed that neurogenic bladder worsens quality of life in spinal cord injured patients. Patients performing CIC had better Quality of life as compared to others. Patients compliance to component of bladder rehabilitation program was good except for bladder diary.

### References

- Hicken BL, Putzke JD, Richards JS. Bladder management and quality of life after spinal cord injury. *Am J Phys Med Rehabil* 2001;80:916-922
- Westgren N, Levi R. Quality of life and traumatic spinal cord injury. *Arch Phys Med Rehabil* 1998;79:1433-1439.
- Levi R, Hultling C, Nash MS, et al: The Stockholm spinal cord injury study: 1. Medical problems in a regional SCI population. *Paraplegia* 1995;33:308-15
- Whiteneck GG, Charlifue SW, Frankel HL, et al: Mortality, morbidity, and psychosocial outcomes of persons spinal cord injured more than 20 years ago. *Paraplegia* 1992;30:617-30
- Wyndaele JJ, Madersbacher H, Kovindha A. Conservative treatment of the neuropathic bladder in spinal cord injured patients. *Spinal Cord* 2001;39:294-300.
- Weld KJ, Dmochowski RR. Effect of bladder management on urological complications in spinal cord injured patients. *J Urol* 2000;163:768-772
- Uebersax, J.S., Wyman, J.F., Shumaker, S.A., McClish, D.K., Fantl, J.A., & the Continence Program for Women Research Group. (1995). Short forms to assess life quality and symptom distress for urinary incontinence in women: The incontinence impact questionnaire and the urogenital distress inventory. *Neurourology and Urodynamics*, 14, 131-139
- OH SJ, KU JH, Jeon JH, Shin HI, Paik NJ et al. health related quality of life of patients using clean intermittent catheterization for neurogenic bladder secondary to spinal cord injury. *Urology* 2005;65:306-310.
- Singh R, Sharma SC, Mittal R, Sharma A. Traumatic spinal cord injuries in Haryana: An Epidemiological Study. *Indian Journal of Community Medicine* 2003;4:184-186.
- Liu CW, Attar KH, Gall A, Shah J, Craggs H. The relationship between bladder management and health related quality of life in patients with spinal cord injury in the UK. *Spinal Cord* 2010;48:319-324
- Jugindro SN, Sanjay K, Ajit SN, Ratnesh K. Urodynamic study of Bladder Behaviour in Traumatic Spinal Cord injury patients in response to Rehabilitation. *IJPMR* 2013;24(4):87-91.
- Tang DH, Colayco D, Piercy J, Patel V, Globe D et al. Impact of urinary incontinence on health-related quality of life, daily activities and healthcare resource utilization in patients with neurogenic detrusor overactivity. *BMC Neurology* 2014;14:74-84
- Tapia CI, Khalaf K, Berenson K, Globe D, Chancellor M et al. Health -related quality of life and economic impact of urinary incontinence due to detrusor overactivity associated with a neurologic condition: a systematic review. *Health and Quality of Life Outcomes* 2013;11:13-27.
- Tate DG, Kalpakjian CZ, Forchheimer MB. Quality of Life issues in Individual with spinal cord injury. *Arch Phys Med Rehabil* 2002;83(2):18-25.