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Original – Voiding dysfunction

Quality of life evaluation in spinal cord injured patients comparing different bladder management techniques

J. Sánchez-Raya[a,], G. Romero-Culleres[b], M.A. González-Viejo[c], L. Ramírez-Garcerán[c], L. García-Fernández[c], and J. Conejero-Sugrañes[d]*

[a]*Hospital de Traumatología y Rehabilitación Vall d'Hebron, Barcelona, Spain*
[b]*Department of Rehabilitation, Fundación Althaia, Manresa, Spain*
[c]*Spinal Cord Injuries Rehabilitation Unit, Hospital Vall d'Hebron, Barcelona, Spain*
[d]*Department of Neurourology, Hospital Vall d'Hebron, Barcelona, Spain*

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ABSTRACT

Objetives: This study examines quality of life among patients with spinal cord injury requiring bladder management techniques, according to the validated King's Health Questionnaire (KHQ).

Material and methods: Prospective and observational study of 91 spinal cord-injured patients (21 women 23% and 70 men 77%). Mean age was 40 years (SD 13.4) and average time since spinal injury was 11.4 (SD 10.4) years. Patients completed the KHQ quality of life instrument and 10 additional questions related to urinary disturbance developed for the study, and filled in a form to subjectively rank their main concerns related to spinal injury. Patients were divided according to the bladder management techniques they regularly used: intermittent catheterization, condom catheter or indwelling catheter, and differences between the mean groups were assessed with the SPSS 13.0 statistics package.

Results: The overall KHQ score for the sample was 39.9 (SD 54.4) with higher scores (poorer QoL) in patients using an indwelling catheter. A thorough analysis of the test showed no significant differences between the groups other than in the physical role limitation item ($p=0.025$). Patients using a condom catheter reported lower physical limitation scores (better QoL) than patients using an indwelling catheter or intermittent catheterization. Sexuality was the main concern of most patients, followed by bowel dysfunction, urinary incontinence and ambulation or gait problems.

Conclusion: Patients treated with condom catheters reported the best quality of life according to KHQ scores, although there were no significant differences versus the other urinary management techniques. The patients' main concern was related to sexuality.

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*Author for correspondence.
E-mail: 34650jsr@comb.es (J. Sánchez-Raya).

Evaluación de la calidad de vida en pacientes con lesión medular comparando diferentes métodos de vaciado vesical

RESUMEN

Objetivo: Valorar el impacto en la calidad de vida que supone la utilización de distintos métodos de evacuación urinaria en pacientes con lesión medular, utilizando un cuestionario específico y validado al español: King's Health Questionnaire (KHQ).
Material y métodos: Estudio observacional y prospectivo con 91 pacientes (21 mujeres 23%, 70 hombres 77%) afectos de lesión medular que acudieron a la consulta durante marzo 2004 y diciembre del 2005, con media de edad 40 años (DS 13,4) y tiempo medio de evolución de la lesión 11,4 (DS 10,4) años.

Los pacientes completaron el KHQ, así como una valoración subjetiva de los principales problemas relacionados con la lesión medular. Se clasificaron los pacientes en función del sistema de evacuación urinaria habitual en: Cateterismos Intermitentes (CI), Sondaje Vesical Permanente (SVP) y Colector Permanente (CP). Analizamos con el paquete estadístico SPSS 12.0 las diferencias entre las medias de las dimensiones del KHQ de los tres grupos.
Resultados: La media de la puntuación total del KHQ fue de 39,9 puntos (DT 54,4), con mejor puntuación en el grupo portador de CP. Encontramos que no hay diferencias significativas, excepto en la dimensión de la limitación de los roles, donde obtienen mejor puntuación el grupo portador de CP que los de SVP y los CI (p = 0,025).

La sexualidad se presenta en primer lugar en la lista de problemas que más preocupa a los pacientes, seguidos de los trastornos de defecación y urinarios.
Conclusión: El grupo con mejor puntuación global en el KHQ es el portador de CP, aunque no hay diferencias significativas entre los 3 grupos. Lo que más preocupa a nuestros pacientes son los problemas sexuales.

Palabras clave:
Calidad de vida
Lesión medular
Incontinencia urinaria
Métodos de recolección urinaria

Introduction

The life expectancy of spinal cord injury (SCI) patients has improved considerably in the last 30 years thanks to advances in the management of such cases. In effect, such patients now live to older ages with their disability - a fact that probably exerts an impact upon their quality of life (QoL). However, some authors consider that although these patients adapt to their situation over time[1], there are no substantial changes in QoL[2].

A number of studies indicate that QoL is affected by many factors, but is not related to the level of the neurological injury[2,3].

At present, QoL is conceived in multidimensional terms, including different categories such as personal competence, perceived QoL, the surroundings and psychological wellbeing. In other words, the concept comprises a synthesis of objective and subjective categories, including personal values and aspirations. More recently, some investigators[4-6] have determined that QoL is related to a series of categories, with their compliance and satisfaction, covering physical, emotional, sexual and educational function, social activities, leisure activities and economic status.

SCI directly or indirectly affects the aspects of life related to QoL[7-9], or at least those related to the domains that affect it - such as health and self-care, independence, access to material means, social relations and relations with the opposite sex, and perceived body image.

One of the least widely studied aspects is QoL related to the management of neurogenic bladder status in these patients. Hickens et al.[6] compared QoL between continent and incontinent patients, and reached the conclusion that continent patients have significantly better QoL.

In measuring results relating to QoL, the literature generally uses the Satisfaction with Life Scale (SF-12), which is an abbreviated form of the Medical Outcomes Survey SF-36, and has been validated for assessing satisfaction based on two subscales — one relating to physical health and the other to mental health — though no scales exclusively evaluating the way in which incontinence affects QoL are used.

We consider that the sphincter alterations affect QoL in SCI patients, with an impact upon their social and occupational integration and, over the long term, are associated to increased morbidity-mortality due to the risk of upper urinary tract damage.

The present study compares QoL in SCI patients using different urine collection systems: condom catheter (CC), intermittent catheter (IC) and indwelling catheter (permanent catheter, PC), with the aim of determining whether bladder management influences QoL in some way. As a secondary objective, we examined the impact of the problems derived from urinary incontinence within the general problems affecting patients with SCI.

Patients and methods

A prospective observational study was carried out, involving the consecutive selection of patients seen in the Neurourology

Unit of Vall d'Hebron Hospital in Barcelona (Spain). We included non-hospitalized patients over 18 years of age, with traumatic SCI. The study involved a single patient visit.

Ninety-one patients completed the QoL questionnaire related to urinary incontinence (UI) - this number representing 6.5% of the series of SCI patients attended in our Unit since 1984.

The data collection period extended from March 2004 to December 2005.

The patient sociodemographic variables were recorded, along with the time from SCI, educational level, occupational activity, the level of the neurological lesion according to the American Spinal Injury Association[11], and the cause of the lesion.

The administered questionnaire was the King's Health Questionnaire (KHQ), which is a specific instrument for evaluating QoL in UI that has been validated in its Spanish version[10]. The questionnaire comprises 21 items, distributed into 9 dimensions: patient perceived health (1 question), impact of UI upon life (1 question), limitation of roles (2 questions), physical limitation (2 questions), social limitation (3 questions), personal relations (2 questions), emotions (3 questions), sleep and energy (2 questions), and actions for coping with UI (5 questions) (table 1). Each item is scored on a Likert-type scale with four possible answers. The score of each dimension ranges from 0 (less impact, better QoL) to 100 (greater impact, poorer QoL). The score of the questionnaire is obtained for each dimension as the sum of the answers to the items, standardizing the score in order to facilitate interpretation: [(real score, minimum score)/(maximum score, minimum score)*100]. As an example: in the emotional dimension = ([{6a+6b+6c–3}]/[12–3]*100).

Table 1 – King's Health Questionnaire (KHQ)

Variable	Dimension	Subdimension	Indicator	Subindicator
Female perception	Description of current health condition		Very good Good Regular Poor Very poor	Score assigned to each indicator
Impact of UI	Influence of UI		None A little Moderately A lot	Score assigned to each indicator
Limitation of roles	Domestic chores, work and activities outside the home	Influence of UI in domestic chores and/or activities outside the home	None Slightly Moderately A lot	Score assigned to each indicator
Physical limitation	Physical activities and capacity to travel	Influence of UI in physical activities and capacity to travel	None Slightly Moderately A lot	Score assigned to each indicator
Social limitation	Social interaction, with friends and family life	Influence of UI in social life, in relationship with friends and family life	None Slightly Moderately A lot	Score assigned to each indicator
Personal relations	Relations with couple and sex life	Influence of UI in relations with couple and sex life	Not applicable None slightly Moderately A lot	Score assigned to each indicator
Emotions	Depression, anxiety and low self-esteem	Influence of UI in mood state and self-esteem	Never Slightly Moderately A lot	Score assigned to each indicator
Sleep and energy	Activity and rest	Influence of UI in sleep pattern, sensation of tiredness	Never Sometimes Often Always	Score assigned to each indicator
Associated symptoms	Presence and frequency of associated symptoms	Yes No	A little Moderately A lot	Score assigned to each indicator

Table 2 – Problems related with spinal cord injury

Problems	Order from greater to less (1-9)
Walking (gait) problems	
Administrative processing	
Use of public transport	
Sexual dysfunction	
Problems with defecation	
Urinary problems	
Ulcers	
Prejudice with people	
Others	

The final score ranged from 0-100 points — higher scores indicating poorer QoL of the patient. In relation to unanswered questions, no assumptions were made, and the score for the corresponding dimension was not calculated.

We added 10 questions related to the urinary problems of the patients with SCI (frequency of urinary infections in the last 6 months, history of orchitis, penile skin lesions caused by the CC, bladder, renal or ureteral stones, and antecedents of nephrectomy or sphincterotomy).

Furthermore, we analyzed the order of importance as expressed by the patients in relation to the most frequent problems associated to SCI, and the order of importance of the urinary alterations in the context of such problems (table 2).

We registered a total of 91 questionnaires and generated three groups according to the usual urine collection method used: 21 used IC, 22 carried CC and 48 used PC.

The data analysis was carried out using the SPSS version 12.0 statistical package for Microsoft Windows. In all comparisons between groups we considered a statistical significance level of 0.05[12]. We assessed the QoL scores in the total study sample and in the three groups separately, and analyzed differences between the means of the total series and of the 9 different dimensions of the questionnaire, based on the chi-squared test and Kruskal-Wallis test for non-parametric data.

Results

Of the 91 completed questionnaires, 70 corresponded to males (77%) and 21 to females (23%). The mean age of the sample was 40 years (SD 13.4), with an average of 11.4 years from the time of SCI (SD 10.4). The youngest patients were those using IC (37 years, SD 13.3), while those with the longest time from SCI used CC (13 years, SD 17.7).

The most frequent cause of SCI was traffic accidents, with 55 cases (60%). Most of the lesions were paraplegias: 57 cases (63%), and 53 patients suffered complete SCI (American Spinal Injury Association grade A)(59%). About 40 of the subjects (44%) had completed secondary education, though only 15 patients were occupationally active (16.5%) — 43 patients (47.5% of the sample) being disabled to the effects of work. As regards marital status, one-half were single (44 patients).

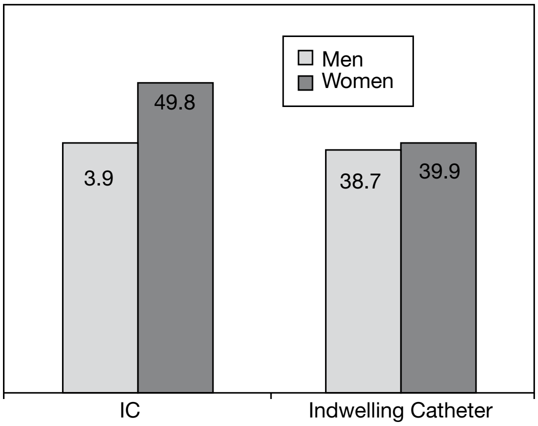

Figure 1 – Mean scores of the King's Health Questionnaire in males.

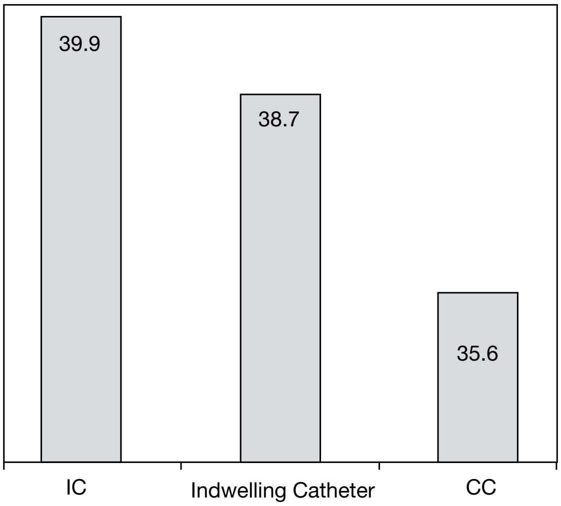

Figure 2 – Mean scores of the King's Health Questionnaire according to patient sex.

The mean total score of the King's Health Questionnaire (KHQ) was 39.9 (SD 54.4), while by individual groups the scores were 43.5 (SD 24) for IC, 40.8 (SD 25.8) for PC, and 35.6 (SD 24.6) for CC.

In general, QoL was found to be better for patients with CC, though no statistically significant differences were recorded among the different groups.

On analyzing the differences in QoL in relation to the urine collection method used and patient sex, no statistically significant differences were observed, though women yielded poorer scores in relation to the two methods compared (IC and PC) (figs. 1 and 2).

On examining the different dimensions we likewise found no statistically significant differences, with the exception of the area relating to the limitation of roles (domestic chores, work and activities outside the home)(p=0.025), where QoL was found to be better among the patients with CC (fig. 3).

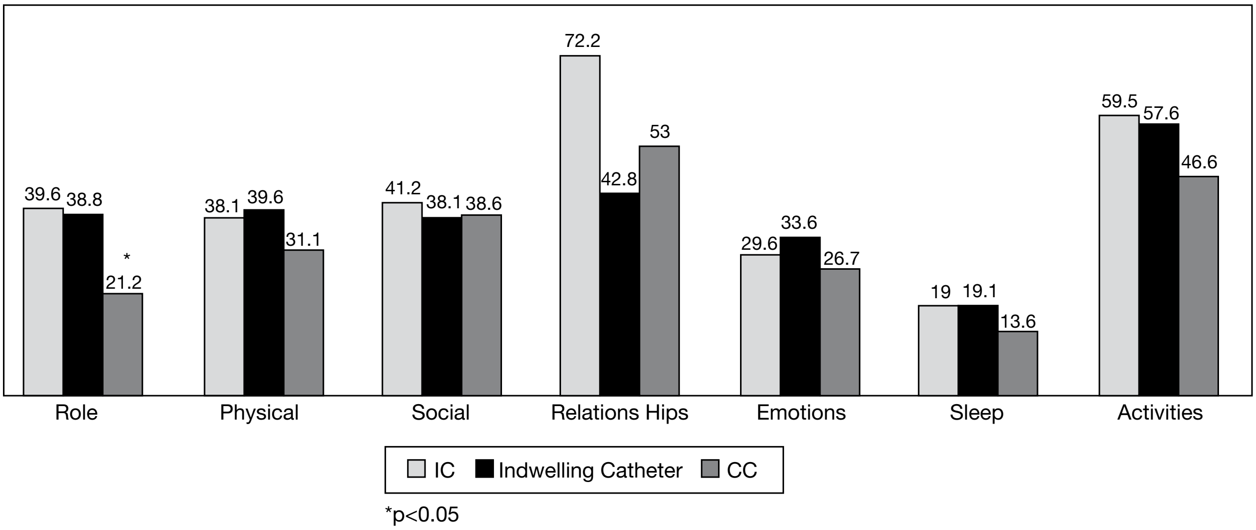

Figure 3 – Mean scores by dimensions of the King's Health Questionnaire.

In relation to the most frequent urinary alterations in the last 6 months, the most relevant was urinary infection, with a prevalence of 45%. This figure is not a cause for concern, since we consider that a single interview is not a good method for assessing the presence or absence of infection. Moreover, no specification was made of whether urinary infection was accompanied by fever or not - evaluation being limited to subjective patient perception.

Among the problems related to SCI, the most important problem in our series by order of frequency was sexual dysfunction, followed by sphincter problems, defecation and micturition, with the same degree of importance. In third place we recorded walking (gait) difficulties. On analyzing the problems according to the urine collection method used, we found the CC group to be more concerned about sexual problems, followed by sphincter alterations (defecation and micturition), and walking in last place. In turn, the PC group was most concerned about walking, followed by sphincter function and sexual problems in third place. The IC group was likewise most concerned about sexual dysfunction, followed by sphincter problems, though in this case ulcer problems ranked third in importance.

Discussion

The objective of treatment in neurogenic bladder patients is the functional preservation of the upper urinary tract, reducing high bladder pressures and avoiding vesicoureteral reflux and thus renal failure - this having been the main cause of mortality in such patients up until the 1970s. A second objective is to ensure maximum continence, to improve patient QoL and contribute to the social and occupational integration of these individuals.

Neurogenic bladder in spinal cord injury (SCI) behaves differently according to the level of the lesion. Thus, lower spinal cord injuries are characterized by urinary incontinence due to a lack of activity of the urethral mechanisms, with an areflexic detrusor muscle and hypoactive urethra — requiring some form of urine collection system to ensure maximum social integration. In contrast, upper spinal cord injuries are characterized by bladder voiding difficulties, with a hyper-reflexic detrusor muscle and a hyperactive urethra (bladder-sphincter dysynergia) — requiring regular intermittent evacuation or PC in order to avoid high bladder pressures and thus preserve the upper urinary tract.

Controversy exists regarding the best approach to the management of these patients. In males, incontinence occurring due to spontaneous micturition without voluntary control, seen in low spinal cord injuries, can be resolved with a condom catheter (CC) connected to a collector bag. This situation is commonly seen in young male patients, as reflected by the findings in our series. However, the situation is more complicated in the case of females, where the options are limited to PC or IC.

The current tendency is to seek the best possible continence through surgery, the use of anticholinergic agents, botulin toxin, etc., and electrical stimulation of the sacral nerve roots.

We considered PC to be the least acceptable option, despite its widespread use. Indeed, indwelling catheters were the worst rated option in the functionality questionnaire specifically targeted to SCI (Spinal Cord Injury Measurement)[13,14], and should be reserved for those patients who because of their upper extremity disabilities, type of neurogenic bladder, age, sociocultural conditions, poor cooperation, or presence of reflux are not amenable to any other management option.

In order to confirm these observations, we aimed to objectively explore the impact upon the QoL of our patients — considering that quality of life is what we really hope to improve.

Our first problem was to find a specific QoL questionnaire for application to neurogenic bladder patients. We found literature references using only the SF-36[15]; however, since we did not consider this to be a specific instrument, we employed a test validated in its Spanish version for urinary incontinence: the King's Health Questionnaire (KHQ)[10].

We found the impact of urinary incontinence (UI) upon QoL in our series of patients with SCI (KHQ: 39.9) to be similar to that seen in a sample of patients without SCI (KHQ: 38.8), corresponding to a recently published study in women with urinary incontinence[16].

In contrast to what we previously believed, the best QoL scores were seen to correspond to patients with CC, followed by patients with PC and finally subjects using IC.

We found no significant differences according to patient sex, or among the different dimensions explored by the KHQ. Only in the area analyzing domestic chores and work did we find QoL to be significantly better in the patients with CC versus the patients carrying PC.

We agree with Espuña et al.[16] that the lengthiness of the KHQ and the difficulty of analyzing its results advise the use of other simpler questionnaires in the context of routine practice — reserving use of the KHQ for research. In our Unit we are currently working on the validation of the adaptation of the KHQ to SCI.

Conclusions

- There are no significant differences among the different methods, though patients using collectors have better QoL than those with IC or PC.
- There are no significant differences in QoL according to patient sex and the urine collection method used, though women show poorer QoL scores.
- There are no differences among the dimensions of QoL among the different urine collection methods. Only the limitation of roles (domestic chores, work and activities outside the home) shows better scores in patients with CC.
- The greatest problems for SCI patients are sexual dysfunction, followed by sphincter problems and walking difficulties.
- Patients with IC and CC are less concerned about urinary problems.
- Patients with indwelling catheters are less concerned about sexual dysfunction.

Conflicts of interest

The authors declare no conflicts of interest.

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