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ORIGINAL ARTICLE

Assessment of male urinary incontinence postprostatectomy through the Consultation on Incontinence Questionnaire-Short Form

Évaluation de l'incontinence urinaire masculine postprostatectomie à travers le Consultation on Incontinence Questionnaire-Short Form *(ICIQ-SF)*

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Urology;
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Summary
Objective. — The objective of this study is to assess the correlation between the urinary incontinence results of the ICIQ-SF, and those obtained in the 1-hour and 24-hour pad tests, in a sample of men that underwent prostatectomy.
Material and methods. — A prospective observational study was carried out in patients from the Integrated Management Area of Vigo (EOXI de Vigo) who underwent prostatectomy and suffered from urinary incontinence in the post-surgery period. Loss of urine was assessed by means of the 1-hour and 24-hour pad tests and the ICIQ-SF. A comparative analysis of the questionnaire findings was performed for both urinary incontinence tests.
Results. — A correlation is observed between the ICIQ-SF and the amount of urine loss in the 1-hour and the 24-hour pad tests. However, the severity of urine loss established by instruments is less consistent. The 24-hour pad test is the one that obtained better correlation with the ICIQ-SF.
Conclusions. — The ICIQ-SF should be validated in a male population after prostatectomy in order to reinterpret the severity values observed in the different instruments studied.
Level of evidence. — 4.

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Prostatectomie

Résumé
Objectif. — L'objectif de cette étude est d'évaluer, dans un échantillon d'hommes qui ont subi la prostatectomie, la corrélation entre les résultats de l'incontinence urinaire de l'ICIQ-SF, et ceux obtenus dans les *pad test* de 1 heure et de 24 heures.
Matériel et méthodes. — Une étude observationnelle prospective a été effectuée dans les patients de la Structure Organisationnelle de Gestion Intégrée de Vigo (*EOXI* de Vigo) qui ont subi la prostatectomie et ont souffert de l'incontinence urinaire dans la période après la chirurgie. La perte d'urine a été évaluée avec les *pad test* de 1 heure et de 24 heures et avec le questionnaire ICIQ-SF. Une analyse comparative des résultats du questionnaire a été faite pour les deux tests d'incontinence urinaire.
Résultats. — On observe une corrélation entre la quantité de perte d'urine dans les *pad test* de 1 heure et de 24 heures et l'ICIQ-SF. Cependant, les degrés de gravité de la perte d'urine établies par les instruments montrent moins de concordance. Le *pad test* de 24 h est celui qui a obtenu un meilleur niveau de concordance avec l'ICIQ-SF.
Conclusions. — Il serait intéressant de mener l'évaluation du questionnaire dans une population masculine après prostatectomie, ainsi que de réinterpréter les degrés de gravité établies par les différents instruments étudiés.
Niveau de preuve.— 4.

Introduction

Urinary incontinence (UI) is a health problem that affects a major part of the population. Until a few years ago, the exact number of people suffering from this problem was unavailable and this was probably due to the fact that although it is a very frequent discomfort, few people actually seek professional help because they feel ashamed to do so or consider it as something unavoidable [1]. Therefore, it is suspected that many patients conceal the problem and do not seek professional help since they consider it as a taboo subject.

Hunskaar et al. conducted a study to analyse the prevalence of female urinary incontinence in 4 European countries: France, Spain, United Kingdom and Germany, and concluded that 35% of women older than 18 years suffered from UI, which represents millions of people in Europe [2]. Other studies have indicated that the rate of overall prevalence of male incontinence ranges from 3% to 11% [3]. Hence, simple tools for detection and diagnosis of UI should be developed.

The International Consultation on Incontinence Questionnaire (ICIQ) was created to address the need for a measuring instrument that would facilitate the detection, diagnosis and comparison of findings from different studies. The committee of experts of the Second International Consultation on Incontinence created this modular questionnaire which incorporates all aspects of incontinence. It is a brief and simple validated questionnaire that evaluates the symptoms and the impact of urinary incontinence [4].

The original version is in English, but it has been translated and adapted into other languages. The final version, which has been translated and culturally adapted in various countries, including Spain, Italy, Brazil and Japan among others [5—10], consists of 3 items ''frequency of UI'', ''amount of leakage'' and ''overall impact of UI'' plus a group of 8 questions related to the type of UI which are only for descriptive and guidance purposes and are not part of the questionnaire score [5].

Stress and urge incontinence symptoms can help predict sphincter incontinence and detrusor overactivity in urodynamic tests, but they cannot determine the root cause of UI as ICIQ does [11]. The ICIQ-SF, together with the 1-hour (1 h) and 24-hour (24 h) pad tests and the urination diary are considered to be the best evidence to establish an initial UI diagnosis [12,13].

With regard to the type of incontinence by sex, it should be noted that women more often suffer stress incontinence at the start, but also develop signs of urge incontinence with age, and then present mixed UI. Men over the age of 75 years most commonly present urge incontinence, and stress incontinence in men is associated with radical prostatectomy (RP) [14].

The objective of this study is to assess the correlation between the ICIQ-SF urinary incontinence results and those obtained in the 1 h and 24 h pad tests, in a sample of men that underwent prostatectomy.

Material and methods

This is a prospective observational study carried out between February 2015 and December 2016, in a group of post-RP patients in the Integrated Management Area of Vigo. The inclusion criterion was the presence of UI after surgical intervention. Patients gave their informed consent to participate in this study, which was approved by the Ourense-Pontevedra-Vigo Research Ethics Committee.

In all, 159 measurements were taken at different times during the evolution of stress incontinence in post-RP patients. The 1 h and 24 h pad tests were used to assess the amount of actual loss of urine in grams, by applying the standardised International Continence Society (ICS) Protocol [11]. Patient's measurements were taken over several time periods throughout their post-surgical recovery phase, by first performing the 1 h pad test and then implementing the ICIQ-SF on the day after completion of the 24 h pad test, and therefore the incontinence severity categories defined for each of the tests should be the same or quite similar when the tests are correlated.

The ICIQ-SF items evaluate UI and its impact on the quality of life by asking patients their frequency of UI and the amount of urine lost via incontinence, and the average inconvenience caused by UI during the past 4 weeks. The first part of the test refers to the frequency and amount of urine loss, while the second part evaluates the interference in the patient's quality of life [15].

The total score resulting from the sum of the first 3 items, ranges from 0 to 21 points [4]. It is classified as low severity when the score is less than 10.5, average severity when score is between 10.5 and 13.5, and high severity when it is greater than 13.5.

Statistical analysis

The IBM SPSS statistical package (version 22) and the R Commander software were used to analyse data. The descriptive parameters for the quantitative variables were mean, standard deviation, minimum and maximum, while those for the qualitative variables were frequencies and percentages. The likelihood ratio was used to compare two qualitative variables and the Spearman's correlation coefficient was used for ordinal variables. The Cohen's Kappa association method was used to determine the degree of diagnostic correlation between the ICIQ-SF and the pad test values. The Pearson correlation coefficient was calculated to study the association between the quantitative variables and a simple linear regression was performed. Lastly, the Kruskal-Wallis test was used to analyse the differences in grams of urine observed between the 1 h and the 24 h pad tests in the different groups. The significance level was fixed at 5% (significant if $P < 0.05$).

Results

The study recorded 159 measurements taken at different times during patients' post-RP follow-up, for the 1 h pad test, the 24 h pad test, and the ICIQ-SF questionnaire. The principal data obtained during the first visit are shown in Table 1.

Table 1 Baseline characteristics of the 45 patients included.

	Baseline determinations ($n = 45$)	
	Mean ± SD	Min—Max
ICIQ-SF score	13.7 ± 3.8	7—21
Urine loss	7.7 ± 1.7	6—11
Quality of life	6.0 ± 2.5	1—10
24-hour pad test (g)	381.8 ± 418.2	6—1629
1-hour pad test (g)	56.6 ± 81.6	1—364

An analysis of the correlation between the classification derived from the 24 h and 1 h pad tests, and that obtained from the ICIQ-SF scores of the 159 measurements, revealed that the three tests are significantly correlated ($P < 0.001$), hence the greater the urine loss the higher the questionnaire score (Table 2).

As can be seen in Table 2, there are differences in the amount of UI measured in grams between the different ICIQ-SF classification levels.

Thus, it is not possible to assign intervals in grams for each of the ICIQ-SF severity classification categories, despite the fact that incontinence differences in grams exist as per the ICIQ-SF severity classification. This becomes evident when we look at the above tables, where one can appreciate an overlap between the different severity values which clearly limit interval definition for them.

The results of both tests therefore show clear discrepancies in terms of severity. If we take the ICIQ-SF reference data as the *gold standard* for the 1 h and 24 h pad tests, we can see that the 24 h pad test only coincides in severity value with the ICIQ-SF in 55.4% of the cases, but the discrepancy is higher in the case of the 1 h pad test where the severity coincidence is only 45.1%.

If we focus only on the initial diagnosis, the 24 h pad test presents a greater correlation (Kappa 0.341; $P = 0.001$) at 62.2% as against 40% for the 1 h pad test, which would place the former test as the more suitable one for diagnosing incontinence (Table 3).

Discussion

There are different methods for the assessment of urinary incontinence. In the present study, the assessment was done by comparing the ICIQ-SF with the 1 h and the 24 h pad tests. As expected, a correlation has been observed between

Table 2 Measurements of the 24 h and 1 h pad tests in the three ICIQ-SF categories.

ICIQ-SF score	n	24-hour pad test			1-hour pad test		
		Mean ± SD	Min—Max	P-value	Mean ± SD	Min—Max	P-value
Low	53	33.8 ± 56.0	1—310	< 0.001	4.9 ± 9.0	0—58	< 0.001
Moderate	53	183.2 ± 219.0	1—788		20.8 ± 34.2	0—173	
High	50	549.4 ± 434.0	11—1629		68.2 ± 77.5	1—364	

Table 3 Correlation between the urinary incontinence severities measured with the ICIQ-SF and the 24-hour pad test UI level.

Incontinence severity in 24-hour pad test	ICIQ-SF severity value		
	Low (0—10.5)	Moderate (10.5—13.5)	High (> 13.5)
Low (4—20 g)	3 (100%)	0 (0%)	0 (0%)
Moderate (21—75 g)	3 (30.0%)	5 (50.0%)	2 (20.0%)
High (> 75 g)	4 (12.5%)	8 (25.0%)	20 (62.5%)

grams of urine loss in the tests and the questionnaire scores, since all three methods have been validated for evaluating urinary incontinence. Therefore, the greater the urine loss in grams in the tests, the higher the score obtained in the questionnaire.

Timmermans et al. [16], in earlier comparisons of the ICIQ with the 1 h pad test, observed a correlation between the ICIQ-SF and the 1 h pad test in an all-female sample. Drai et al. [17] were unable to observe a qualitative correlation between the two tests, however, worth noting is that the sample in this study consisted of men who underwent RP. The authors moreover proposed the use of the 24 h pad test instead of the 1 h test, which coincides with the results obtained in our work since, as indicated above, there is a better fit with the 24 h test than with the 1 h test. This fact is demonstrated in the study by Soto et al. [18] wherein they conclude that there is discrepancy between the two diagnostic tests in terms of severity values, indicating that the most appropriate one is the 24 h pad test, given the high rate of false positives in the 1 h pad test.

Other authors that compared the ICIQ-SF with the 24 h pad test were García-Bascones et al. [19] who observed a positive linear relationship between the 24 h pad test and the ICIQ, just like in the case of Karantanis et al. [20] who observed a statistically significant correlation between the two instruments. Both studies were carried out on a sample of women with UI.

Another aspect analysed in our study, i.e. the severity values, showed no correlation between the pad tests and the questionnaire. García-Bascones et al. [19] observed moderate correlation between test scores of the 24 h pad test and the ICIQ-SF in a sample of women, while Karantanis et al. [20] observed that although the 24 h pad test shows correlation with the subjective severity value of the questionnaire, it does not show correlation with the subjective frequency in women.

Timmermans et al. [16] observed that the average score obtained in the ICIQ-SF is 13.5 ± 4.6 (which would correspond to moderate-to-high severity) where the mean for the pad test was 8 grams, which would indicate low severity of incontinence, and hence their results are inconsistent in terms of severity.

Haga et al. [15] observed a score of 139—193 grams of urine loss for the 24 h pad test, which indicates a high incontinence, but the ICIQ-SF scores lay between 9.5 ± 5.1, indicating a low-to-moderate incontinence and, once again, the severity scores do not match.

In the light of the above, we need to highlight the following points: the severity scores of the 24 h pad test described by O'Sullivan et al. [21] were obtained from an exclusively female sample, and moreover, the validations of the ICIQ-SF and their adaptation to the different languages were once more done in women-only samples except in the adaptation to the Portuguese language, where the sample also included men, but they only accounted for 30% of the sample.

On the other hand, and as explained in Yokohama et al. [22], patients with RP experience a serious structural damage due to the high amount of urine loss in grams; 680 grams recorded in post-RP patients in the 24 h pad test, this figure being much higher than the severity values currently defined in female samples.

Conclusions

The amount of urine loss recorded in the 1 h and 24 h pad tests is correlated with the ICIQ-SF scores, that is to say, the higher the urine loss recorded in the pad test, the higher the ICIQ-SF score. However, there is disagreement on the actual severity score determined by the ICIQ-SF and the pad tests because they do not coincide to a great extent.

Therefore, there arises a need for a) validation of this questionnaire in a male post- prostatectomy population, and b) reinterpreting the severity values by sex.

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Disclosure of interest

The authors declare that they have no competing interest.

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