Is There Any Difference Between Questionnaires on Pediatric Lower Urinary Tract Dysfunction?

Mesut Altan, Burak Çitamak, Ali Cansu Bozaci, Emin Mammadov, Hasan Serkan Doğan, and Serdar Tekgül

OBJECTIVE To investigate the diagnostic properties of 3 different scoring systems (Dysfunctional Voiding Symptom Score [DVSS], Dysfunctional Voiding and Incontinence Symptoms Score [DVISS], Incontinence Symptom Index-Pediatric [ISI-P, for children older than 11 years]) that are used to evaluate lower urinary tract symptoms in pediatric population.

MATERIALS AND METHODS Eighty-four participants were evaluated by detailed history, physical examination, 3 different scoring systems (DVSS, DVISS, ISI-P), ultrasonography, and uroflowmetry. Depending on the tests, cases were stratified as healthy or lower urinary tract symptoms (LUTS) by 2 urologists who were blinded to the questionnaires. Patients were reevaluated by the same tests and questionnaires 3 months after treatment. Diagnostic properties of questionnaires were calculated. Additionally, parents were asked to scale the improvement of symptoms subjectively from 0% to 100% to correlate to each of the three scoring systems.

RESULTS The mean ages of the normal and the LUTS groups were 9.1 ± 2.6 years and 10.1 ± 2.8 years, respectively ($P = .301$). Gender (male:female) distribution was 21:21 in the LUTS group and 25:17 in the control group ($P = .381$). In terms of diagnosis, DVISS has the highest accuracy (sensitivity: 81%, specificity: 97.6%, accuracy: 89%) followed by ISI-P (sensitivity: 55.6%, specificity: 100%, accuracy: 82%) and DVSS (sensitivity: 54.8%, specificity: 97.6%, accuracy: 76%). The similar order was valid for the 23 patients older than 11 years (accuracy for DVISS: 87%, for ISI-P: 82%, and for DVSS: 78%). In terms of response to treatment, all 3 tests showed good correlation with parents' ratings (DVSS: $P < .001$, DVISS: $P = .005$, ISI-P: $P = .042$).

CONCLUSION Although DVISS had the highest accuracy in distinguishing the patients from healthy controls, all 3 questionnaires seem to be equivalent for the evaluation of response to treatment. UROLOGY ■■: ■■–■■, 2017. © 2017 Elsevier Inc.

Pediatric voiding dysfunction and urinary incontinence are as common as 10% with varying degrees of severity.[1,2] Children with voiding dysfunction may have complaints such as daytime urinary incontinence, urgency, urinary retention, difficulty in urination, and constipation.[3-5] Although they are generally disturbing symptoms without any major complication, some may suffer from additional morbidity such as recurrent urinary tract infection, reflux and even upper tract damage. This condition may also cause some major mental health and psychosocial problems such as general anxiety state, low self-esteem, and fear of humiliation.[6,7] It is of utmost important to define the severity of the problem with objective parameters and to assess the response to treatment in the follow-up using the same objective evaluation.

This can be done by voiding diaries and structured evaluation tools like symptom questionnaires. Voiding diaries are good but their use is not practical, and they carry reliability problems. There are some questionnaire forms for voiding problems in children with the aim of facilitating the diagnosis and evaluating the response to the treatment. These questionnaires can be listed as Dysfunctional Voiding Symptom Score (DVSS), Incontinence Symptom Index-Pediatric (ISI-P), Dysfunctional Voiding and Incontinence Scoring System (DVISS), and Pediatric Urinary Incontinence quality of life (PIN-Q).[8-13] In the pediatric urology literature, there is no study comparing these questionnaires with each other in terms of diagnosis and follow-up. The aim of this study was to compare

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From the Department of Urology, Hacettepe University School of Medicine, Hacettepe Üniversitesi Hastaneleri, Erişkin Hastanesi, B Katı Üroloji Anabilim Dalı, Sıhhıye, Ankara 06100, Turkey

Address correspondence to: Ali Cansu Bozaci, M.D., Department of Urology, Hacettepe University School of Medicine, Hacettepe Üniversitesi Hastaneleri, Erişkin Hastanesi, B Katı Üroloji Anabilim Dalı, Sıhhıye, Ankara 06100, Turkey. E-mail: alicansu@doctor.com

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DVSS, ISI-P, and DVISS that are used in the diagnosis and follow-up of voiding dysfunction and to determine the clinical importance of the PIN-Q questionnaire form.

MATERIALS AND METHODS

After obtaining approval of the local ethics committee, 42 patients (>5 years old) who completed toilet training and admitted to our clinic between 2014 and 2015 with lower urinary tract symptoms (LUTS) such as urgency, urinary retention, difficulty in urination, or complaint of urinary incontinence, and 42 patients who were admitted to our clinic with no urinary problem but other nonurinary tract-related problems such as hydrocele and undescended testis were included. The categorization of the cases was confirmed by 2 pediatric urologists (H.S.D and A.C.B). The group that was diagnosed with voiding dysfunction was evaluated as the patient group whereas the other patients were evaluated as the control group. The patients with neurogenic and anatomical problems were excluded from the study. All the cases in the patient and control groups filled DVSS, DVISS, PIN-Q questionnaires, and in addition, the patients equal to or above 10 years old filled ISI-P test. All the tests were given to families of the patients who were ≤10 years old, but in other patients tests were given to children and it was told that they can be assisted by their families whenever they request them to. The patient group was subjected to urine analysis, urinary tract ultrasonography, uroflowmetry, and postvoid residual urine test. In accordance with the clinical complaints and evaluations, the patient group was treated with standard urotherapy recommendations, anticholinergic treatment, or desmopressin. After 3 months, the patient group was invited for a control visit and the same questionnaires were applied again. At the same time, all the patients were asked to report a percent that represents their recovery rates and these values were recorded as the subjective recovery rates (SRR) given by the patients or parents.

Those having scores above 9 in females and above 6 in males in DVSS, above 8 in DVISS without quality of life (QoL) score, and above 9 in ISI-P were accepted as patient according to the test result. The score alterations of each questionnaire, before and after the treatment of the patient group, were calculated in percents and recorded as "questionnaire recovery rate" (QRR).

The DVISS had already been validated in Turkish population. A linguistic translation study was designed for the rest of the questionnaires (DVSS, ISI-P, PIN-Q). Two researchers (H.S.D. and A.C.B) and 2 professional translators translated these original English questionnaires into Turkish language, independently. Four of the translators synthesized a final Turkish version for each one. Afterwards, a bilingual (Turkish and English) speaker who did not have access to the original English version translated the final Turkish papers into English. These final papers were compared with original English ones and no major differences were seen. A consensus on Turkish documents was agreed on, and a pilot test with condensed Turkish papers was given to 10 patients to verify the comprehensibility of the questionnaire. With the results of the pilot group study, minor modifications were made and a final version was agreed on.

The data were analyzed in SPSS program. Patient and healthy groups according to questionnaires were compared with patient and control group diagnosed by the clinicians using chi-square test. A comparison of continuous variables between 2 groups was done by using Mann-Whitney *U* test or *t* test regarding the distribution of the values. The proportions of 2 groups were compared by chi-square test. Improvement percentages obtained from each questionnaire (QRR) and recovery percentages obtained by the patients (SRR) were evaluated using Spearman's correlation analysis. A *P* value below .05 was considered significant.

RESULTS

Mean age in the patient group was 8.83 ± 2.4 years and 9.86 ± 2.6 years in the control group (*t* test, $P = .354$) and the ratio of female to male was 21:21 in the patient group and 17:25 in the control group (chi-square test, $P = .381$). Urinary incontinence was present in 20 patients only at night, in 8 patients only at daytime, and in 14 patients both at night- and daytime. Recommendations of standard urotherapy were explained for all the patients and families. Thirteen patients were treated only with oxybutynin, 21 patients were treated only with desmopressin, and 8 patients were treated both with desmopressin and oxybutynin.

Mean scores of each questionnaire for patient and control groups were statistically different (Table 1).

In terms of diagnosis, DVISS has the highest accuracy (sensitivity: 81%, specificity: 97.6%, accuracy: 89%) followed by ISI-P (sensitivity: 55.6%, specificity: 100%, accuracy: 82%) and DVSS (sensitivity: 54.8%, specificity: 97.6%, accuracy: 76%). The similar order was valid for the 23 patients who were older than 10 years (accuracy for DVISS: 87%, for ISI-P: 82%, and for DVSS: 78%) (Table 2). There was a significant correlation between SRRs of the patients and QRRs of each questionnaire (DVSS: $P < .001$, DVISS: $P = .005$, ISI-P: $P < .001$) (Table 3).

Both PIN-Q and the 14th question of DVISS (which scores the quality of life) were able to distinguish patients from the control group (for PIN-Q: 35.2 ± 16.4 (2-64) vs 2.1 ± 5.2 (0-18), $P < .001$; and for DVISS-14: 1.38 ± 1

Table 1. Comparison of first-visit questionnaires' mean scores between patient and control groups that is determined by clinicians (*P* value for chi-square test)

	All Participants			23 Participants Older Than 10 Years		
	Dysfunctional	Normal	*P*	Dysfunctional	Normal	*P*
Participant number, n	42	42		9	14	
DVISS, mean ± SD	13.8 ± 6.4	1.81 ± 2.6	<.001	11.3 ± 7.1	1.5 ± 2.5	<.001
DVSS, mean ± SD	9.6 ± 6	2.7 ± 2.8	<.001	7.4 ± 5.7	2.3 ± 2.8	<.001
ISI-P, mean ± SD	—	—	—	11 ± 7.3	1 ± 1.8	<.001

DVISS, Dysfunctional Voiding and Incontinence Scoring System; DVSS, Dysfunctional Voiding Symptom Score; ISI-P, Incontinence Symptom Index-Pediatric.