Original Article

Psychological status of patients with nephrotic syndrome undergoing percutaneous renal biopsy

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Abstract

Background: Nephrotic syndrome (NS) is a common clinical disease with four main clinical manifestations: hypoalbuminemia (<30 g/L), macro-proteinuria (>3.5 g/24 h), edema, and hyperlipidemia. There is a variety of pathological types that are associated with NS. Percutaneous renal biopsy (PRB) plays an important role in clinical practice in that it can be used to establish a histological diagnosis, to provide information for an ultimate NS diagnosis, and subsequent prognosis. Our aim was to observe the psychological status of patients with NS before and after PRB and investigate the factors affecting their psychological status.
Methods: Two hundred and thirty-five patients with NS were enrolled in the present study. We evaluated the psychological status of patients 24 hours before and 6 hours after PRB by using the Symptom Check List-90 and State-Trait Anxiety Inventory.
Results: We analyzed the factors affecting the psychological status of the study participants before and after this important NS procedure. Before the PRB procedure was administered, the factorial anxiety and phobic anxiety scores were higher than normal ($p < 0.0.5$). After PRB, only anxiety was determined to be higher than normal in the somatization score ($p < 0.05$). In general, there were higher scores among males rather than the female study participants ($p < 0.05$). Scores of all indices decreased significantly in all patients after PRB ($p < 0.05$).
Conclusion: Psychological status was common in patients who underwent PRB and were affected by many factors.
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Keywords: anxiety; biopsy; depression; nephrotic syndrome

1. Introduction

Nephrotic syndrome (NS) is a common clinical disease with a variety of pathological types. Percutaneous renal biopsy (PRB) is an essential tool for the practice of nephrology, and can be instrumental in establishing a histological diagnosis to provide information regarding kidney diseases for better diagnosis and prognosis.[1] The introduction of an automated

biopsy gun and localization of the kidney with ultrasound guidance have optimized the efficacy and safety of the whole PRB procedure, and complications associated with renal biopsy had been dramatically reduced.[2,3] Poor psychological status is typically observed in patients who agree to undergo renal biopsy, before and after the procedure. However, it has been noted that depression and anxiety are common psychological reactions to PRB. These abnormal psychological reactions were affected by many factors.

Analysis of these factors can provide a reference to improve patients' poor psychological status. In the present study, we evaluated the psychological status of these patients by using the Symptom Check List-90 (SCL-90) and the State-Trait Anxiety Inventory (STAI),[4] and analyzed those factors

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which influenced psychological status. SCL-90 is an easily completed (about 15 minutes) instrument used during psychotherapy to monitor patient status and is sensitive to a subjective relapse of symptoms. The STAI is a questionnaire that is used to evaluate patients' anxiety levels. Our aim was to observe the psychological status of patients with NS before and after PRB and to investigate factors affecting psychological status.

2. Methods

Two hundred and thirty-five patients were provided medical treatment and the data were collected by the Department of Nephrology, Shandong University Qilu Hospital from September 2010 to July 2011. Exclusionary criteria included history of mental illness, including brain organic psychosis, symptomatic psychosis, functional psychosis, psychogenic psychosis, and neurosis. All of the above were excluded by a medical practitioner specializing in the diagnosis and treatment of mental illness.

All of the patients in this study were diagnosed with NS. Before PRB occurred, all patients were provided detailed explanations about the procedure by the operating doctor. This information included the importance, necessity, and possible complications of the procedure, and how the operation was tied into the process of PRB. All questions from the patients were answered in detail and objectively, and patients were encouraged to communicate with patients who had already accepted PRB, the purpose of which was to relieve some of the psychological tension from PRB. All enrolled cases accepted PRB with ultrasound-guide and 6 hours absolute rest.

The anxiety experience of patients accepting and undergoing PRB was evaluated with SCL-90 and STAI. All patients completed the SCL-90 scale and STAI scale within both 24 hours before and 6 hours after PRB; these questionnaires were individually completed in an environment conducive to subjectively honest response, without communication with family members. PRB was conducted within 24 hours after the preprocedure survey was completed, and patients were asked to remain in a supine status 6 hours after PRB. The normal score is the score distribution of normal groups comprising people who have some common features of a group or groups of a sample.[5–8]

The study protocol for this investigation was approved by the ethics committee of Qilu Hospital, and written informed consent was obtained from all patients after they had carefully read and understood a written summary of the study plan.

2.1. Statistical analysis

All analyses were performed using the Stata statistical software package (version 9.0) (Stata Corporation, USA). Data were described as means and standard deviations for continuous variables and as frequencies and proportions for categorical variables. Thereafter, Pearson's was applied to test for correlations among study variables. The Mann-Whitney test was used for comparisons of ranked scores. Significance was accepted at $p < 0.05$.

3. Results

The demographic data of enrolled patients can be seen in Table 1. Twenty-six of the study participants were over 60 years of age, whereas 209 were not more than 60 years old. Two hundred and sixteen cases had a middle school or above educational level, accounting for 91.9% of the total study population. There was also a significant difference in duration of illness, in different age and different educational background ($p < 0.05$, Table 1).

The levels of distress of somatization, anxiety, depression, and phobic anxiety before and after PRB were higher than normal in the SCL-90 scale ($p < 0.05$) (Table 2). There was a difference, but the difference did not reach statistical significance, between communication and no-communication with patients who already accepted PRB (Table 3). The psychological status of study group was affected by many factors, including sex, age, and exact time of evaluation (Tables 2 and 4). The level of anxiety in men was more elevated than in women ($p < 0.05$). There was no significant difference between the results of patients with different ages (Table 5). The time that study participants were evaluated did affect their scores, and there was a significant difference between scores 24 hours before and 6 hours after PRB, which were both higher than normal (Table 2).

4. Discussion

NS is a common clinical disease which has four primary clinical manifestations: hypoalbuminemia (<30 g/L), macroproteinuria (>3.5 g/24 h), edema, and hyperlipidemia.[9] There are a variety of pathological types in NS, but there is

Table 1
The demographic data of enrolled patients ($\bar{x}\pm s$).

Item	Sex		Age (y)		Educational background	
	Men	Women	>60	≤60	Middle school	Other
N (%)	126 (53.6%)	109 (46.4%)	26 (11.1%)	209 (88.9%)	216 (91.9%)	19 (7.1%)
DI (mo)	2.1 ± 0.3	1.9 ± 0.4	2.7 ± 0.5	1.3 ± 0.8*	1.4 ± 0.1	2.6 ± 0.6*

* $p < 0.05$ in age, ≤60 years versus >60 years.
* $p < 0.05$ in educational background, ≥ middle school versus other.
DI = duration of illness.

Table 2

Assessment of psychological status using Symptom Check List-90 ($\bar{x}\pm s$).

Scales	Normal score	Before PRB	After PRB
Somatization	1.37 ± 0.48	1.56 ± 0.23[*]	1.45 ± 0.31[*,**]
Compulsive symptom	1.62 ± 0.58	1.63 ± 0.61	1.61 ± 0.25
Interpersonal sensitivity	1.65 ± 0.51	1.64 ± 0.69	1.65 ± 0.29
Depression	1.50 ± 0.59	1.90 ± 1.02[*]	1.79 ± 0.38[*,**]
Anxiety	1.39 ± 0.43	1.68 ± 0.56[*]	1.54 ± 0.46[*,**]
Hostility	1.48 ± 0.56	1.45 ± 0.28	1.46 ± 0.28
Phobic anxiety	1.23 ± 1.41	1.39 ± 0.49[*]	1.35 ± 1.05[*]
Paranoid ideation	1.43 ± 0.57	1.32 ± 0.25	1.39 ± 0.98
Psychoticism	1.29 ± 0.42	1.26 ± 0.34	1.28 ± 0.2
Positive Symptom Distress Index	1.44 ± 0.43	1.41 ± 0.34	1.42 ± 0.51
Positive symptom total	24.92 ± 18.41	25.10 ± 12.06	23.91 ± 9.78
Global Symptom Index	2.60 ± 0.59	2.49 ± 0.71	2.46 ± 0.4

[*] $p < 0.05$ versus normal score.
[**] $p < 0.05$ after PRB versus before PRB.
PRB = percutaneous renal biopsy.

no correlation between the level of proteinuria and pathological types. PRB plays an important role in the establishment of a histological diagnosis. Although the efficacy and safety of the PRB procedure are very high, a change in psychological status is typically observed in patients accepting renal biopsy. These abnormal psychological reactions were affected by many factors.

In the present study, SCL-90 and STAI were chosen to assess the psychological status of patients because they are widely used through treatment. The SCL-90 testing mechanism comprises 90 items organized within nine different scales.[5] Three global indices for each test participant are calculated: Global Symptom Index, Positive Symptom Distress Index, and Positive Symptom Total.[6–8] The STAI was adapted by TEA Ediciones in 1982. The STAI includes 20 items with four points on a scale from 0 = "not at all", to 3 = "very much so".[10] There are also two facets: one is the State Anxiety Scale Questionnaire and another is the Trait Anxiety Scale Questionnaire.[11–13] All items in each scale were based on a 2-factor model of anxiety present or anxiety absent. It contains two 20-item components which were designed to measure how much worry, tension, or apprehension the patient experiences in his or her present circumstances (State Anxiety Scale Questionnaire), and how much anxiety represents a personality characteristic (Trait Anxiety Scale Questionnaire). It emphasizes the frequency of symptoms (ranging from 1 = "not at all", to 4 = "very much").

Every invasive treatment, to be completed successfully, should involve a close and knowledge-based state of disclosure and information between physicians, patients, and their families. Adequate preoperative conversation is important prior to treatment.[14,15] Informed consent is crucial to help provide for balanced clinical treatment behavior.[16,17] A sufficient level of comprehension is required to allow patients to completely understand the information provided, with the time and opportunity to read, evaluate, and consider the information presented.[18,19] Furthermore, satisfactory informed consent decreased the psychological burden of patients. In the present study, there were different degrees of psychological reactions in patients after perioperative communication with doctors (Table 3), similar to the results of other studies before examination.[20,21] But after the operation, there was no significant

Table 3

Assessment of psychological status using Symptom Check List-90 before percutaneous renal biopsy ($\bar{x}\pm s$).

Scales (before PRB)	Normal score	With communication[a]	Without communication[b]
Somatization	1.37 ± 0.48	1.51 ± 0.17[*]	1.59 ± 0.33[*]
Compulsive symptom	1.62 ± 0.58	1.62 ± 0.40	1.63 ± 0.19
Interpersonal sensitivity	1.65 ± 0.51	1.64 ± 0.72	1.65 ± 0.16
Depression	1.50 ± 0.59	1.88 ± 0.97[*]	1.95 ± 1.11[*]
Anxiety	1.39 ± 0.43	1.67 ± 0.61[*]	1.70 ± 0.37[*]
Hostility	1.48 ± 0.56	1.46 ± 0.12	1.44 ± 0.35
Phobic anxiety	1.23 ± 1.41	1.38 ± 0.51[*]	1.41 ± 0.34[*]
Paranoid ideation	1.43 ± 0.57	1.34 ± 0.25	1.31 ± 0.27
Psychoticism	1.29 ± 0.42	1.27 ± 0.13	1.25 ± 0.51
Positive Symptom Distress Index	1.44 ± 0.43	1.42 ± 0.30	1.40 ± 0.13
Positive symptom total	24.92 ± 18.41	25.07 ± 9.3	25.34 ± 8.71
Global Symptom Index	2.60 ± 0.59	2.47 ± 0.36	2.50 ± 0.47

[*] $p < 0.05$ versus normal score.
PRB = percutaneous renal biopsy.
[a] With communication with other patients who already accepted PRB.
[b] Without communication with other patients who already accepted PRB.

Table 4
Assessment of psychological status using State-Trait Anxiety Inventory after percutaneous renal biopsy ($\bar{x}\pm s$).

	Total		Men		Women	
	S-AI	T-AI	S-AI	T-AI	S-AI	T-AI
Score	$50.21 \pm 10.1^{*}$	41.09 ± 9.06	49.98 ± 11.28	40.98 ± 6.58	$50.06 \pm 9.12^{*}$	40.87 ± 7.56
Normal score	39.91 ± 8.66	41.22 ± 7.63	39.71 ± 8.89	41.11 ± 7.74	38.97 ± 8.45	41.31 ± 7.54
t	10.25	1.21	8.06	1.22	7.16	1.09

* $p < 0.05$ versus normal score.
S-AI = State Anxiety Scale Questionnaire; T-AI = Trait Anxiety Scale Questionnaire.

difference between patients with communication and without communication.

Because of the complexity of clinical diagnosis and treatment of NS, PRB is a necessary way to obtain renal pathological diagnosis, aiming to provide a sufficient basis for proper diagnosis and treatment.[22] Patients have always shown psychological status both before and after PRB. The present study demonstrated that the patients accepting PRB had an obvious anxiety mood. Lower scores were noted after treatment than before treatment (Table 2), and this phenomenon demonstrated that time was necessary to eliminate the impact of PRB on patients. Sex and age also affected the psychological status, and good communication with patients who already accepted PRB facilitates the relief of anxiety (Table 3). In patients over 60 years of age, the global symptom index was higher than in other patients, but there was not a significant difference between the two groups. The present study indicated that there was a significant difference in duration of illness, as well as different age and different educational background ($p < 0.05$, Table 1). The above phenomenon can be explained by the fact that younger patients with a higher educational background may consult earlier with a physician due to uncomfortable physical symptoms.

It is apparent that experienced communication and conversation with patients coupled with an elevated level of experience with renal biopsy and advanced equipment led to a reduction in the psychological burden of patients. The typical patient psychological status is complex and subject to influence by a variety of factors. Although the SCL-90 and STAI testing devices used in the present study cannot provide enough information to reflect the actual situations, the results of the present study still provided a reference for clinical practice.

In conclusion, the finding of psychological status was commonplace in patients with NS who agreed to undergo PRB. Our study confirmed that there was a significant difference between the scores of NS patients and those without NS. The psychological reactions of our study participants were influenced by many factors. The clinical workers must do their best to alleviate the psychological burden of patients accepting invasive treatment for better results.

4.1. Limitations

Although psychological status was always seen in nearly invasive procedures including PRB, the question remains whether the results are suitable for other kind of renal diseases? The duration of the entire study was too short and the psychological status was evaluated over a limited period of time; so a longer period of time is necessary to observe the influence of PRB on the psychological status of patients.

Acknowledgments

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Table 5
The global symptom index in age ($\bar{x}\pm s$).

Before PRB		After PRB	
>60 y	≤60 y	>60 y	≤60 y
2.48 ± 0.26	2.50 ± 0.31	2.45 ± 0.53	2.46 ± 0.90

PRB = percutaneous renal biopsy.

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