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Original Article

Association between international prostate symptom score and frailty status in elderly hospitalized chinese males with benign prostate hyperplasia

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Abstract: Objective: Benign prostate hyperplasia (BPH) and frailty commonly present in elderly male together. The aim of this study is to evaluate the association between International Prostate Symptom Score (IPSS) and frailty status in elderly hospitalized Chinese males with BPH, which will provide a scientific theory evidence for clinical treatment and nursing. Subjects and methods: From January 2013 to December 2015, 510 hospitalized patients older than 60 years with benign prostate hyperplasia and underwent surgical treatment were included in the study. Each subjects signed informed consent. All subjects answered a detailed questionnaire including demographic information, etc. And IPSS was used to evaluate the status of symptom of BPH, and Tilburg Frailty Indicator (TFI) were used to evaluate the status of frailty of these cases. Results: We found that 396 cases (77.6%) of hospitalized patients with BPH which frailty scores ≥5 points, which indicated a status of frailty. And cases with frailty had a higher IPSS (27.37±5.58) than the cases without frailty (25.26±5.95, P<0.001). Age and IPSS were significantly correlated with TFI scores, and significant positive association was found between IPSS and TFI scores after adjusting for age. Conclusion: Hospitalized BPH patients with frailty had a higher IPSS than cases without IPSS. And status of frailty was positively associated with IPSS.

Keywords: Benign prostate hyperplasia, frailty, international prostate symptom score, tilburg frailty indicator

Introduction

With the acceleration of the aging process, the number of people aged ≥60 is about 177 million, accounting for 13.26% of the total population in China. What should be taken attention is that the population over age of 80 years old has reached 20 million, with a annual growth rate of 5%. Frailty is a state of increased vulnerability and decreased capacity of regulating homoeostasis, it might have an effect on the heterogeneity of health status in the elderly people [1]. Frailty is considered to be a geriatric syndrome with multi-organ function and physical reservation reduction, which increases the risk of fall, hospitalization, disability, death and other adverse outcomes [2, 3].

Benign Prostate hyperplasia (BPH) is one of the most common diseases in urology all over the world. It is an aging related diseases with the incidence rate increasing year by year [4, 5]. For most aged patients, variant degree of underlying diseases can be found and the repair ability of their important organs and tissues to trauma decreased. The tolerance for surgery and anesthesia is poor thus frail old patients are prone to have postoperative complications even death [6-8]. Therefore, evaluating of the frailty scientifically has a significant meaning to ensure the safety of elderly patients who undergoing operations for BPH. In this study, we investigated the occurrence and the association between International Prostate Symptom Score (IPSS) and frailty status in elderly hospitalized Chinese males with BPH, which will provide a scientific theory evidence for clinical treatment and nursing.

Subjects and methods

Ethics statement

This prospective clinical study was approved by the Ethics Committee of the First Affiliated

Table 1. Demographic and clinical characteristics of BPH patients with or without frailty

	Without frailty (N=114)	With frailty (N=396)	t/χ^2	*P*
Age (years)	66.89±4.77	73.30±6.25	11.699	<0.001
BMI	22.25±2.64	22.09±3.29	0.500	0.617
Education Status			1.957	0.581
Illiteracy	20	57		
Primary School	54	174		
High school	27	105		
College	13	60		
Occupation			0.006	0.541
Yes	8	27		
No	106	369		
Smoking			0.415	0.519
Yes	34	106		
No	80	290		
Drinking			0.621	0.256
Yes	22	64		
No	92	332		
Concomitant diseases			3.516	0.061
Yes	52	220		
No	62	176		
Living himself			2.272	0.132
Yes	39	79		
No	75	217		
IPSS	25.26±5.95	27.37±5.58	3.493	<0.001

Hospital of Anhui Medical University (Approval No. 20160206). Written informed consent was obtained from all the patients enrolled in the study.

Study population

From January 2013 to December 2015, 510 patients ≥60 years old with BPH and undergoing surgical treatment were enrolled in this study. All patients signed informed consent. The pre-operation examinations were performed in all patients as follow: the physical examination, blood test and imaging examination. Inclusion criteria included: age ≥60 years old, pathological diagnosis of BPH, normal communication and can complete the assessment tests. Exclusion criteria included prostate malignancies, severe cognitive disorder, history of mental illness or antipsychotics.

Evaluation methods

All patients were evaluated by clinical observation, with assessment of general information, IPSS and Tilburg frailty questionnaire. General information included age, height, weight, marital status, educational status, income, occupation, smoking, drinking, concomitant diseases, etc. Tilburg frailty indicator (TFI) was performed according to the questionnaire published by Dr. Gobbens from Tilburg University in Netherland, 2010 [9]. Chinese version of Tilburg frailty indicator was translated by Xi et al, the reliability and validity has been investigated and was suitable for the evaluation of Chinese patients with frailty. All patients were receiving physical examination, blood routine test, conventional biochemical test, prostate-specific antigen (PSA) test and imaging examination before surgery.

Statistical analysis

SPSS 19.0 software (Chicago, Illinois) was performed for Statistical analysis. For the quantitative data, results are expressed as mean ± SD and a two-tailed unpaired Student t-test was used. The chi-square test was performed on comparison of proportions. And to illuminate the association between IPSS, TFI scores, and to eliminate the influence of some related factors, such as age, Pearson correlation and partial correlations were used. All statistical analyses were two-sided, and a *P* value <0.05 was considered statistically significant.

Results

Cases with frailty had a higher IPSS than the cases without frailty

TFI was performed to asssess the status of frailty according to Dr. Gobbens. et al. And a score ≥5 points indicates a status of frailty. In our study, we found that 396 cases (77.6%) of hospitalized patients with BPH had a status of frailty. And no significant differences were found in BMI, educational status, income, occupation, smoking, drinking, concomitant diseases, living himself or not etc. between cases with or without frailty (all P>0.05). Although subjects

Table 2. Correlations between Age, IPSS and TFI score

	IPSS	TFI score	Physical domain	Psychological domain	Social domain
Age	0.060	0.590*	0.555*	0.543*	0.021
IPSS		0.276*	0.284*	0.254*	-0.064

*P<0.01.

Table 3. Correlation between IPSS and TFI score after adjusting for age

	IPSS	
	Adjust *r*	*P*
TFI score	0.298	<0.001
Physical domain	0.301	<0.001
Psychological domain	0.263	<0.001
Social domain	-0.065	0.141

with a status of frailty had higher age (73.30± 6.25) and more IPSS (27.37±5.58) than cases without frailty (66.89±4.77, 25.26±5.95, respectively, both P<0.001). The detailed demographic and clinical characteristics were showed in **Table 1**.

Correlations between age, IPSS and TFI score

The statistical analysis results revealed that (**Table 2**) age was significantly correlated with TFI scores (r=0.590, P<0.01), and two domains of TFI: physical domain (r=0.555, P<0.01) and psychological domain (r=0.543, P<0.01) positively, although no significant correlations were found between age and social domain or IPSS. It was also found that IPSS was significantly positively correlated with TFI scores (r=0.276, P<0.01), physical domain (r=0.284, P<0.01) and psychological domain (r=0.254, P<0.01). Similarly, no significant correlation was found between IPSS and social domain.

Correlation between IPSS and TFI score after adjusting for age

Considering patients with frailty had a higher age than ones without frailty, and age was strongly correlated with TFI scores, the association between IPSS and frailty status was evaluated after adjusting for age. We found that IPSS was positively correlated with TFI scores (adjust r=0.298), physical domain (adjust r= 0.301) and psychological domain (r=0.263, all P<0.001) after adjusting for age. And there were no significant correlations was found between IPSS and social domain, either. The results were showed in **Table 3**.

Discussion

In this study, we found that 396 cases (77.6%) of hospitalized patients with BPH which frailty scores ≥5 points, which indicated a status of frailty. And cases with frailty had a higher IPSS than the cases without frailty. Age and IPSS were significantly correlated with TFI scores. Furthermore, significant positive association was found between IPSS and TFI scores after adjusting for age. To our knowledge, this is the first study to systematically evaluate the associations between IPSS and frailty status in elderly hospitalized Chinese males with BPH.

BPH is the most common benign disease which could cause urination dysfunction in the elderly men and the urinary symptoms grow progressively with aging [10]. This disease could affect patients' physical and mental health, quality of life and frailty status severely. Long-term dysuria, urine retention and secondary infection or lithiasis could lead to kidney function damage. Furthermore, secondary hemorrhage might make patients feel anxiety. The elderly BPH patients were afraid to take part in outside activity and had poor sleeping quality due to frequent urination, which has a severe effect on patients' quality of life [11]. Some studies have shown that the incidences of frailty in elderly people were increased with aging and dieaseses [12, 13], which were similar with our study. Mario et al. have found that age was associated with the occurrence of frailty in a research of frailty in elderly cancer patients. In addition, their research pointed out that there was a higher risk of incident frailty in cancer group compared to controls and cancer is associated with higher frailty scores [13]. Cakmur also conduct an investigation to summarize the fitness and frailty of elderly adults living in a rural area of Turkey and he found that there was a statistically significant relationship between frailty and older age, BPH, urinary incontinence, depression, and a lack of social support [14]. In our study, it was also found that 396 cases (77.6%) of hospitalized patients with BPH had variant degrees of frailty, and the frail cases had higher age and higher IPSS than subjects without frailty. The course of disease

and underlying diseases in patients can affect their daily life, and long illness course decreased patients' quality of life and increased their frailty.

Although many efforts have been done by many researchers to discover the cause of frailty syndrome, a clear conclusion has not been drawn. Some study speculated that frailty syndrome may have similar etiology with Alzheimer's disease [15], but further studies were needed to confirme the suppposition. In Cornman's study, both frailty and physiological dysregulation have been hypothesized to be early indicators of the risk for poor health and mortality [16]. And other studies showed that pre-operative frailty were related to the occurrence of post-operative complications significantly [17]. This may caused by decreased response capacity to surgery as a result of multi-organ function decreasing and physical reservation reduction in elderly patients. Transurethral resection of prostate (TURP) was considered to be the standard surgical treatment for BPH. In recent years, new methods, such as transurethral holmium laser enucleation of the prostate (HoLEP) were applied to clinical therapy of BPH [18, 19]. Therefore, although minimally invasive surgeries emerging, appropriate evaluation and intervention of frailty status still have important meaning in choosing surgical methods and preventing complications in BPH patients.

To our best knowledge, this is the first study concerning on the correlation between frailty and IPSS in elderly patients with BPH in China. Large population and high medical costs of BPH have become a social problem, and frail patients take more health services and make extra burden on family and society. As a consequence, the significance of frailty assessment and intervention stands out in the aging society. Our study also has some shortcomings. Above all, we only found that the status of frailty was related to IPSS, but a following research is needed to investigate whether a decreased IPSS after operation will result in a remissive status of frailty.

Conclusion

Frailty is commonly seen in elderly patients with BPH. Hospitalized BPH patients with frailty had a higher IPSS than cases without IPSS. And status of frailty was positively associated with IPSS. Therefore, it was needed to assess the status of frailty of hospitalized BPH patients before operations, and it might reduce the occurrence of post-operative complications.

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Disclosure of conflict of interest

None.

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References

[1] Fried LP, Ferrucci L, Darer J, Williamson JD, Anderson G. Untangling the concepts of disability, frailty, and comorbidity: implications for improved targeting and care. Gerontol A Biol Sci Med Sci 2004; 59: 255-263.

[2] Morley JE, Vellas B, van Kan GA, Anker SD, Bauer JM, Bernabei R, Cesari M, Chumlea WC, Doehner W, Evans J, Fried LP, Guralnik JM, Katz PR, Malmstrom TK, McCarter RJ, Gutierrez Robledo LM, Rockwood K, von Haehling S, Vandewoude MF, Walston J. Frailty consensus: a call to action. J Am Med Dir Assoc 2013; 14: 392-397.

[3] Clegg A, Young J, Iliffe S, Rikkert MO, Rockwood K. Frailty in elderly people. Lancet 2013; 381: 752-762.

[4] Lucca I, Shariat SF, Hofbauer SL, Klatte T. Outcomes of minimally invasive simple prostatectomy for benign prostatic hyperplasia: a systematic review and meta-analysis. World J Urol 2015; 33: 563-570.

[5] Robinson TN, Wu DS, Pointer L, Dunn CL, Cleveland JC Jr, Moss M. Simple frailty score predicts postoperative complications across surgical specialties. Am J Surg 2013; 206: 544-550.

[6] Partridge JS, Harari D, Dhesi JK. Frailty in the older surgical patient: a review. Age and Ageing 2012; 41: 142-147.

[7] Feng L, Nyunt MS, Feng L, Yap KB, Ng TP. Frailty predicts new and persistent depressive symptoms among community welling older adults: findings from Singapore longitudinal aging study. J Am Med Dir Assoc 2014; 15: 76, e7-e12.

[8] Brown PJ, Roose SP, Fieo R, Liu X, Rantanen T, Sneed JR, Rutherford BR, Devanand DP, Avlund K. Frailty and depression in older adults: a high-risk clinical population. Am J Geriatr Psychiatry 2013; 21: 46-57.
[9] Gobbens RJ, Van Assen MA, Luijkx KG, Wijnen-Sponselee MT, Schols JM. The Tilburg Frailty Indicator: Psychometric Properties. J Am Med Dir Assoc 2010; 11: 344-355.
[10] Miano R, De Nunzio C, Asimakopoulos AD, Germani S, Tubaro A. Treatment options for benign prostatic hyperplasia in older men. Med Sci Monit 2008; 14: RA94-102.
[11] Komiya A, Suzuki H, Awa Y, Egoshi K, Onishi T, Nakatsu H, Ohki T, Mikami K, Sato N, Araki K, Ota S, Naya Y, Ichikawa T. Clinical effect of naftopidil on the quality of life of patients with lower urinary tract symptoms suggestive of benign prostatic hyperplasia: a prospective study. Int J Urol 2010; 17: 555-562.
[12] Patel KV, Brennan KL, Brennan ML, Jupiter DC, Shar A, Davis ML. Association of a Modified Frailty Index With Mortality After Femoral Neck Fracture in Patients Aged 60 Years and Older. Clin Orthop Relat Res 2014; 472: 1010-1017.
[13] Pérez-Zepeda MU, Cárdenas-Cárdenas E, Cesari M, Navarrete-Reyes AP, Gutiérrez-Robledo LM. Cancer and frailty in older adults: a nested case-control study of the Mexican Health and Aging Study. J Cancer Surviv 2016; 10: 736-42.
[14] Cakmur H. Frailty among elderly adults in a rural area of Turkey. Med Sci Monit 2015; 21: 1232-1242.
[15] Dunne MJ, Abah U, Scarci M. Frailty assessment in thoracic surgery. Interact Cardiovasc Thorac Surg 2014; 18: 667-670.
[16] Cornman JC, Glei DA, Goldman N, Weinstein M. Physiological Dysregulation, Frailty, and Risk of Mortality Among Older Adults. Res Aging 2016; [Epub ahead of print].
[17] Partridge JS, Harari D, Dhesi JK. Frailty in the older surgical patient: a review. Age Ageing 2012; 41: 142-147.
[18] Elshal AM, Mekkawy R, Laymon M, Barakat TS, Elsaadany MM, El-Assmy A, El-Nahas AR. Holmium laser enucleation of the prostate for treatment for large-sized benign prostate hyperplasia; is it a realistic endourologic alternative in developing country? World J Urol 2015; 34: 399-405.
[19] Yao Z, Sun B, Zhou G, Yang Y, Zhang L, Liu L, Sheng H, Guo H. Application of two micron laser vaporesection combined with transurethral resection of the prostate in treatment of benign prostatic hyperplasia: analysis of 340 cases. Int J Clin Exp Med 2015; 8: 19418-19423.