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Original Article

Antidepression medication improves quality of life in elderly patients with benign prostatic hyperplasia and depression

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Abstract: We aim to explore the influence of an antidepression medication on symptom scores and quality of life in elderly patients with benign prostatic hyperplasia accompanied by depression. We conducted a randomized controlled clinical trial which included 94 elderly patients with benign prostatic hyperplasia accompanied by depression in Xuan Wu Hospital and Beijing Boai Hospital during August 2008 to May 2012. The study was designed to compare outcomes related to patient quality of life (QoL). The patients were randomly assigned to one of two groups, consisting of a control group (n = 47) and a therapy group (n = 47), and were followed up for 3 months. The pre-treatment and post-treatment changes among patients in the two groups were compared using their respective IPSS symptom scores, HAM-D scores, and scores on the Short Form 36 Health Survey. Following treatment, the patient IPSS symptom scores in the therapy group were significantly lower than those in the control group (10.74 ± 4.72 vs. 16.42 ± 8.09, respectively; $t = 4.157$, $P < 0.05$). Additionally, each measured dimension of QoL was significantly higher in the therapy group [total score (69.12 ± 3.92) vs. (61.30 ± 3.51), $P < 0.05$]. The results show antidepression medication can improve the symptoms and quality of life among elderly patients with benign prostatic hyperplasia accompanied by depression. Our findings suggest that an antidepression medication should be included when treating elderly patients with benign prostatic hyperplasia.

Keywords: Benign prostatic hyperplasia, depression, symptom score, quality of life, elderly

Introduction

BPH (benign prostatic hyperplasia) is one of the most common disorders in aging men, and affected ~917 million men worldwide in 2008 [1]. BPH can cause dysuria, urinary retention, and even renal failure. Additionally, BPH is often accompanied by depression, which can place a significant burden on an elderly patient's quality of life (QoL) [2, 3]. Depression among the elderly has become a significant and growing worldwide public health problem [4], and is often associated with chronic inflammatory diseases. Additionally, due to its high prevalence, depression is expensive to treat on a national scale [5]. Depression is associated with increased utilization of medical services, longer hospital stays, disabilities, and increased functional impairment. As a result, patients with depression are less productive and more frequently absent from work or unemployed than workers without depression [6, 7]. In addition to its humanistic burden, suicide as a result of depression also has substantial economic consequences [8].

Symptoms of BPH include frequent urination, urgency, and urinary incontinence; additionally, BPH can be complicated by urinary tract infections and hematuresis. Experiencing such symptoms and complications for long periods of time can easily make an elderly patient feel depressed and pessimistic. Such feelings can also significantly reduce the patient's level of physical activity and cognitive abilities [9]. Some studies have reported a significant asso-

ciation between depression and BPH; however, it remains unclear whether this relationship represents unidirectional or bidirectional causality [10]. Johnson TV et al reported that questions in the International Prostate Symptom Score (IPSS), and specifically QoL questions, can be used to predict depression [3]. However, few studies have been conducted which examine the effects of antidepressant treatment on symptom scores and quality of life in elderly patients with both BPH and depression. Therefore, we conducted a randomized controlled clinical trial to explore the influence of an antidepression medication on symptom scores and QoL in elderly patients with BPH accompanied by depression.

Materials and methods

Study population

This study enrolled a total of 94 elderly male patients (mean age 70.20 ± 8.70 years) with BPH and depression (n = 94), who were recruited from Xuan Wu Hospital and Beijing Boai Hospital between August 2008 and May 2012. Patient inclusion criteria consisted of advanced age (> 60 years) and suffering from BPH and depression.

The study exclusion criteria were as follows: patients with lithangiuria and urinary infection; urinary tract stenosis; malignant tumors; significant suicidal risk; unstable physical disorders; dementia; neurological disorders significantly affecting CNS function, including a history of seizures; a lifetime history of any organic mental disorder, psychotic disorder or mania; substance abuse or dependence active within the previous 6 months; clinical or laboratory evidence of hypothyroidism without adequate and stable replacement; Parkinson's disease; a family history of mental illness; and taking antipsychotic medications.

Study design

We conducted a randomized, parallel-group, multicenter study which enrolled a total of 94 elderly patients. All study participants underwent a standardized clinical assessment which included a medical history, physical and neurological examinations, Hamilton Depression Rating Scale (HAM-D) tests, psychometric evaluations, an electrocardiogram, complete blood count, urinalysis, blood chemistry screening, and thyroid function tests. The 94 patients were randomly assigned to two groups: a control group (n = 47) which received conventional medical treatment with finasteride capsules (5 mg, qd) and tetracycline hydrochloride tablets (2 mg, qn), or a case group (n = 47) which received conventional medical treatment for BPH, supplemented with citalopram (20 mg, qd). Patients in both groups were followed for 3 months. All study participants provided a written Informed Consent prior to enrollment, and the study protocol was approved by the Ethics Committee of Xuan Wu Hospital, Capital Medical University, China.

Data collection, management, and quality assurance

All data were collected on standardized study forms according to documented procedures, and by uniformly trained physicians. The patient response and data recovery rates were 100%; the lost to follow-up rate was 4.1%. Two individual physicians entered the study data into a clinical center database which had been developed and provided to each site in the form of a local database. The data were then checked by another physician. Data quality was ensured through standard data checks, and losses to follow-up were balanced across the two groups.

Prostatic volume

The longitudinal, transverse, and anteroposterior diameters of each prostate gland were measured by ultrasound. Prostate volume was determine by the following formula: Prostate volume (mL) = longitudinal diameter (cm) × transverse diameter (cm) × anteroposterior diameter (cm) × 0.52. Reductions in bladder storage and voiding symptoms were assessed by the IPSS questionnaire [11, 12], which uses the following system to grade symptoms: mild, 1~7; medium, 8~19; severe, 20~35. Prostate volumes were estimated and IPSS tests were administered at the beginning of the study and at the end of the third month.

Neuropsychological testing

Neuropsychological testing was conducted using HAM-D. The HAM-D evaluation includes questions designed to measure patient anxiety/somatization, body quality, cognitive impair-

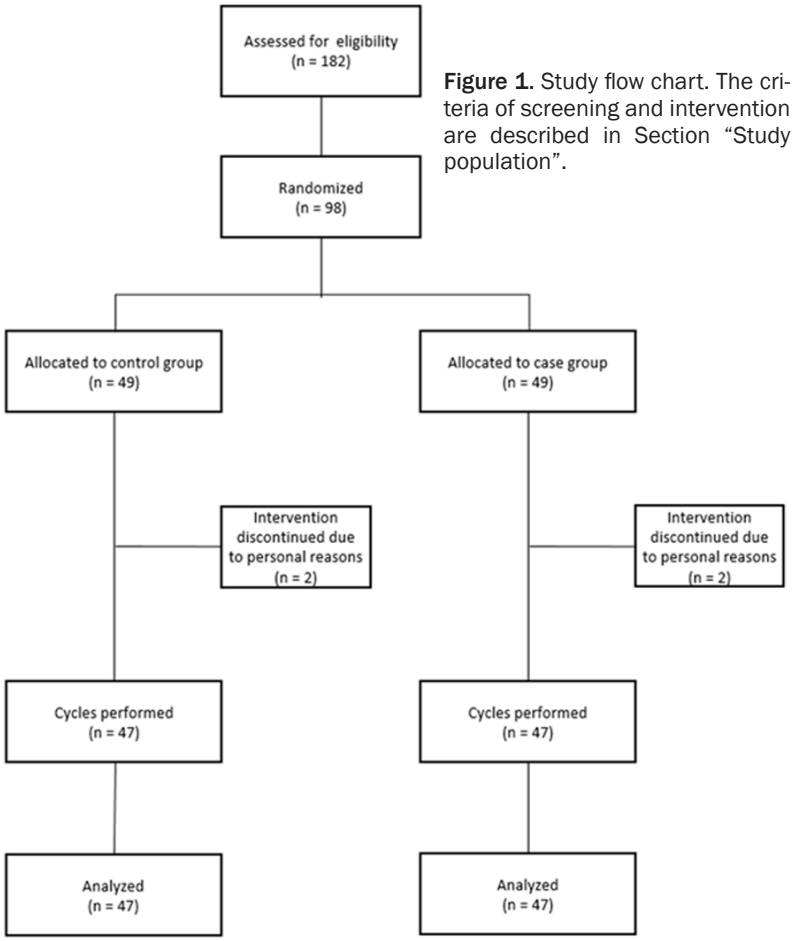

Figure 1. Study flow chart. The criteria of screening and intervention are described in Section "Study population".

ment, day and night changes, block, sleep disorder, and feelings of hopelessness. The HAM-D evaluation was administered to patients in the presence of two physicians, using the generally accepted method of conversation and observation. Higher scores indicated greater degrees of illness.

Quality of life

The SF-36 scale was used to assess eight areas of QoL, which included physical function, role physical, bodily pain, general health, vitality, social functioning, role-emotional, and mental health. Higher scores indicated a better QoL, and lower scores indicated a worse QoL [13].

Statistical analysis

The paired t-test was conducted using SPSS for Windows, Version 12.0. Chicago, IL: SPSS Inc. Data are expressed as the mean ± SEM. Non-normal distributed data were analyzed using the Rank Sum Test method. Differences with *P*-values < 0.05 were considered statistically significant.

Results

A total of 182 potential patients were screened for eligibility, and 49 patients were randomized to each of the two groups. Two patients from the control group and two patients from the case group discontinued due to personal reasons. As a result, 47 control patients and 47 case patients were finally treated (**Figure 1**).

Comparison of common factors between the two groups

Comparisons between the two groups in terms of age, prostatic volume, TC, TG, CRP, HDL-C, LDL-C, Cr, FPG, and BMI are shown in **Table 1**. There were no significant differences in the above parameters between the two groups, which indicates they were comparable.

Comparison of group IPSS scores before and after treatment

Prior to treatment, the mean IPSS scores of the control and case groups were 30.19 ± 6.09 and 29.86 ± 5.90, respectively, and the difference was not statistically significant (P = 0.790, t = 0.267). However, following treatment, the mean IPSS score in the case group was significantly lower than that in the control group (10.74 ± 4.72 vs. 16.42 ± 8.09, P = 0.000). Additionally, IPSS scores in both groups prior to treatment were significantly lower than the scores following treatment (P = 0.000).

Comparison of HAMD scores before and after treatment

As shown in **Figure 2**, there was no significant difference between the HAM-D scores of the control group and case group prior to treat-

Table 1. Comparison of common factors between the two groups ($x \pm s$)

Groups	Number	Age (Years)	Prostatic volume (mL)	TC (mmol/L)	TG (mmol/L)
Control group	47	70.1 ± 10.1	29.8 ± 5.3	4.7 ± 2.9	1.7 ± 0.9
Case group	47	69.1 ± 9.8	30.0 ± 6.0	4.6 ± 3.7	1.8 ± 0.8
Groups	HDL-C (mmol/L)	LDL-C (mmol/L)	Cr (mmol/L)	FPG (mmol/L)	BMI (kg/m^2)
Control group	2.2 ± 0.9	2.5 ± 1.1	77.1 ± 13.2	5.9 ± 2.9	24.3 ± 3.3
Case group	2.1 ± 0.8	2.4 ± 1.4	75.4 ± 12.4	6.0 ± 3.2	24.8 ± 3.5

Footnotes: Compared to the control group: all P > 0.05. TC: total cholesterol; TG: triglyceride; HDL-C: high density lipoprotein cholesterol; LDL-C: low density lipoprotein cholesterol; Cr: creatinine; FPG: fasting plasma glucose; BMI: body mass index.

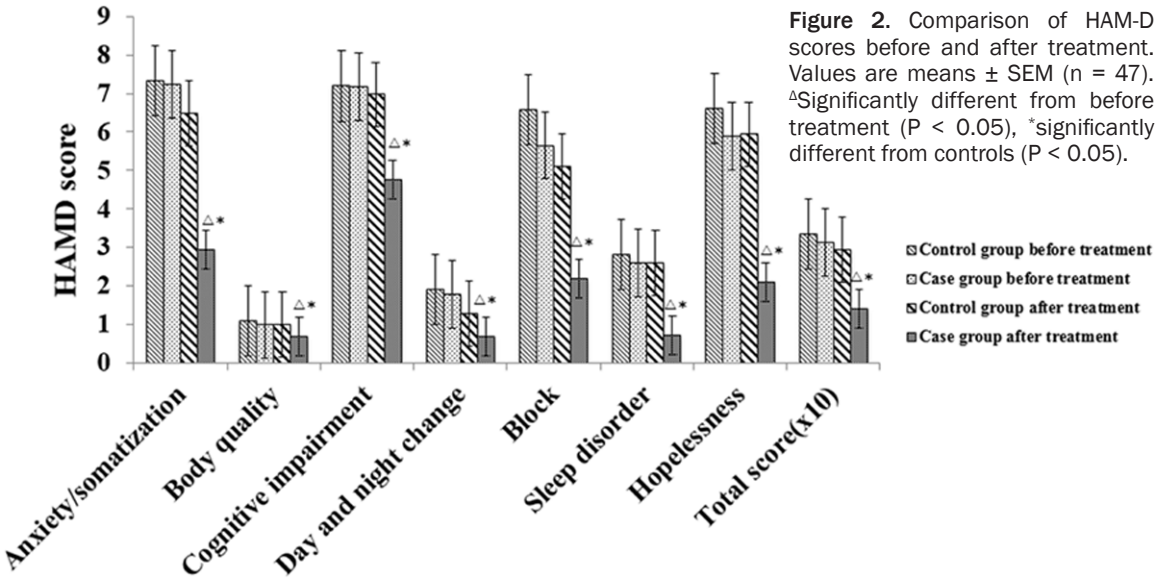

Figure 2. Comparison of HAM-D scores before and after treatment. Values are means ± SEM (n = 47). $^{\Delta}$Significantly different from before treatment (P < 0.05), *significantly different from controls (P < 0.05).

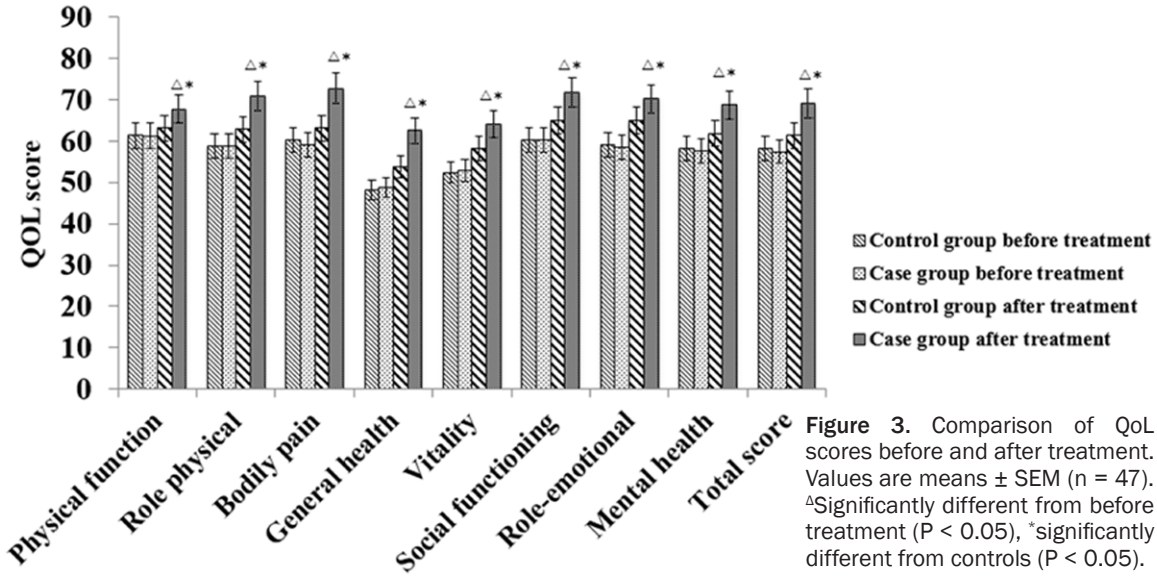

Figure 3. Comparison of QoL scores before and after treatment. Values are means ± SEM (n = 47). $^{\Delta}$Significantly different from before treatment (P < 0.05), *significantly different from controls (P < 0.05).

ment. However, following treatment, the HAM-D scores in the case group were significantly lower than those in the control group. Also, the HAM-D scores in the case group following treatment were significantly lower than those prior to treatment.

Comparison of QOL scores between before and after treatment

As shown in **Figure 3**, there was no significant difference between the QoL scores in the control group and case group prior to treatment. However, the QoL scores in the case group significantly increased following treatment.

Discussion

Our study results showed that after 3 months administration of an antidepressant given in combination with standard BPH treatment, elderly patients with BPH merged with depression had significantly lower IPSS symptom scores, compared to those in a control group which did not receive antidepressant treatment; suggesting a better QoL among patients in the treatment group. Patients with BPH have a higher risk for depression, and investigators have shown that the severity of lower urinary tract symptoms in patients with BPH is relevant to depressive symptoms which significantly affect a patient's QoL [14, 15]. In a study conducted by Montorsi F et al [16], the improved QoL provided by combination medication as compared to each monotherapy alone was maintained throughout 4 yr of treatment; however, 36-45% of patients were not satisfied with their medical treatment [17]. Also, a study which included 30,000 patients from the United States, Britain, and Switzerland showed a poor QoL and higher incidence of depression among patients with urinary tract symptoms [13]. Urinary tract symptoms can significantly influence various dimensions of a patient's QoL, and affect both their overall and mental health [13]. Research conducted in other countries has shown that depression, age, lower urinary tract symptoms, the total number of chronic diseases, and exercise are all predictors of QoL. In contrast, depression, stress, smoking, lower urinary tract symptoms, and sexual function were predictors for the mental factors of QoL. Additionally, those studies recommended that programs designed for improving the QoL of BPH patients should include nursing intervention and the use of a BPH symptoms management system [18].

In this study, the QoL for elderly patients with BPH accompanied by depression improved following treatment with an antidepressant. Currently, the physiological mechanism for how depression leads to a decreased QoL remains unclear. However, a study has shown that chronic and rational stress produced by depression affects a patient's immune status, and leads to increased levels of interleukin (IL) 2, 4, and 6 receptors [19]. High levels of IL-2 and IL-6 can aggravate depressive symptoms by acting on single amine neurotransmitters or the hypothalamus - pituitary - adrenal axis. Additionally, IL-6 can also stimulate further increases in serotonin, causing an imbalance in the nerve-endocrine-immune system, which can produce a state of immune dysfunction in patients with depression [19].

Patients with depression show a poorer compliance with medical instructions compared to individuals with other illnesses [20, 21]. Treatment for depression is generally pharmacologic. However, pharmacotherapy may not be a first-choice treatment for patients with mild depression [22], and psychotherapy, a healthy diet, and exercise are also recommended for managing this illness. The reduced symptom scores resulting from antidepressant treatment in the current study may have partially resulted from improved patient compliance. Enhanced-care programs, including programs which use remote enhanced care, have been shown to support patient compliance, improve clinical outcomes, and be cost-effective [23, 24].

Our study shows that antidepressant treatment, when provided in addition to conventional prostate drug treatment, can effectively improve symptoms of depression in elderly patients with BPH accompanied by depression, and thus improve the QoL for these patients. The levels of psychological and social function among elderly patients undergoing clinical treatment for BPH need to be addressed. This may be done by providing psychological counseling and health education, strengthening social support networks, checking for early signs of depression, and providing early intervention when needed. If implemented, such a scientific and comprehensive treatment program could extend life expectancy and improve QoL [22].

Conclusions

Our present study found that addition of an antidepression medication to standard BPH

therapy can reduce clinical symptoms and improve the QoL for elderly patients with BPH accompanied by depression. Our findings contribute to a growing body of knowledge on how to improve the QoL for elderly patients.

Limitations

Our current study has several limitations that should be mentioned. First, participation in this study was restricted to patients living in Beijing; hence, our results may not be representative for the overall Chinese population. Second, the follow-up time in this study was limited to 3 months. Due to this short follow-up time, issues concerning recall bias, quality control, and other aspects of a study inevitably occur, and a second study with longer follow-up is warranted. A second study should also include an in depth analysis of patient survival data.

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Disclosure of conflict of interest

None.

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