Correlation of prostate volume with international prostate symptom score and quality of life in men with benign prostatic hyperplasia

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ABSTRACT

The aim of this study was to correlate the prostate volume with international prostate symptom score (IPSS) and quality of life (QOL). Hundred consecutive patients diagnosed as having benign prostatic hyperplasia were included. All patients were interviewed using standardized questionnaires for International Prostate Symptom Score, which include one single disease-specific quality of life question. Transabdominal ultrasonogram was used to assess the prostatic volume. Data was analyzed using the statistical package for social sciences (SPSS) for Windows. The mean age and median duration of symptom was 67.5 years and 12.0 months respectively. The mean volume of prostate was 42.5 cm^3. Most of the patients had severe symptoms with mean IPSS of 23.5 and single disease-specific QOL score of 5.2. The correlation between the prostate volume and age, IPSS, and QOL score were not statistically significant except for two domains; incomplete emptying and nocturia that appear to be correlated with prostate volume. The correlation between IPSS and QOL score was strong. Similarly, correlation between QOL score and age was significant but weak. In conclusion, prostate volume had no correlation with age, symptom score, and quality of life score. So prostatic size should not be an only and important consideration; moreover, we should assess the impact of symptoms while treating the cases.

Keywords: Benign prostatic hyperplasia, international prostate symptom score, prostate volume, quality of life.

INTRODUCTION

Benign Prostatic Hyperplasia (BPH) is one of the most common diseases to affect men beyond middle age. The mechanisms linking the histological process and lower urinary tract symptoms remain uncertain; prostatic enlargement and bladder outlet obstruction are involved.[1] Men with severe burden of lower urinary tract symptoms (LUTS) often have measurable decrements in overall health-related quality of life (QOL), which can be ameliorated by treatment. These patients seek medical advice for the bothersome LUTS and the relief of symptoms and improvement in QOL are the most frequent indications for intervention.[2]

Measurements of prostate volume and the severity of bladder outlet obstruction correlate poorly with the severity of lower urinary tract symptoms; one should assess the severity of symptoms rather than the increase in prostate volume during the management of BPH. The severity of lower urinary tract symptoms can be measured reliably with a number of validated questionnaires like International Prostate Symptom Score (IPSS), Boyarsky score, Madsen Iversen score and Danish prostatic symptom score. These questionnaires are used to measure symptoms severity only, and are not diagnostic tests to determine whether symptoms are due to BPH.[2]

The most important issue for patients with BPH is how much this condition bothers them. It is rarely a life threatening disease and primarily affects QOL; special attention should be paid to QOL before initiation of any treatment. The IPSS-QOL score, which is determined by the question "if you were to spend the rest of your life with your prostate symptoms just as they are now, how would you feel about that?" is a very simple but the most fundamental question.[3] So this study was designed to determine the relationship among the three important parameters of BPH; the prostate volume, IPSS and QOL which play a major role in deciding the appropriate treatment option.

MATERIALS AND METHODS

This clinical study was conducted in B.P Koirala Institute of Health Sciences between January 2004 and January 2005 on 100 patients who were diagnosed as having BPH. Those patients having past history of prostatic surgery, prostatic carcinoma, urethral stricture or neuropathic bladders were excluded from the study.

All patients were assessed with clinical history, examination and interviewed using standardized questionnaires for IPSS. All required investigations,

transabdominal ultrsonography (TAUS) to assess prostate size and uroflowmetry in non-catheterized patients were performed. The IPSS is a numerical symptom scoring system that grades the severity of seven symptoms based on how frequently each symptom afflicts the sufferer. The scale for each symptom ranges from 0 (symptom never present) to 5 (symptom always present). The seven symptoms are "incomplete emptying", "frequency", "intermittency", "urgency", "weak stream", "hesitancy" and "nocturia". The disease-specific quality of life question provides a separate QOL score with a scale ranging from 0 (delighted) to 6 (terrible).

Data from filled Performa was entered and analyzed using the statistical package for social sciences (SPSS) for Windows. Pearson's correlation coefficient was used to assess correlation between prostate size and other variables. The level of significance for all tests was set at $P<0.05$.

RESULTS

The mean age of patients in this study was 67.5 ± 8.5 years. Most of the patients (44.0%) lie in the age group of 61.0-70.0 years. The median duration of symptoms was 12.0 months. Among the patients, 69.0% presented with acute urinary retention while 3.0% of patients with obstructive uropathy. The mean volume of the prostate was 42.5±12.7 cm^3 and average PSA was 1.4±0.8 ng/ml. The average maximum flow rate (Q_{max}) in those patients who were not in catheter was 16.3 ml/s.

Table-1: Descriptive statistics

	Mean	SD	Range
Age (years)	67.5	8.5	48 - 85
Duration of Symptoms (months)	22.1	29.2	2 - 240
Prostate Volume (cm3)	42.5	12.7	13 - 77
International prostate symptom score	23.5	2.8	15 - 29
Incomplete emptying (IE)	3.3	0.7	2 - 5
Frequency (F)	3.1	0.8	2 - 5
Intermittency (I)	2.7	1.1	0 - 5
Urgency (U)	2.9	1.3	0 - 5
Weak Stream (W)	3.8	0.7	1 - 5
Straining (S)	3.6	0.7	0 - 5
Nocturia (N)	4.0	0.8	1 - 5
Obstructive Symptoms (IE+I+W+S)	13.4	1.8	9 - 16
Irritative Symptoms(F+U+N)	10.1	1.4	6 - 13
Quality of life score	5.2	0.6	4 - 6
Maximum flow rate (ml/s)	16.3	8.0	6 - 37
Prostate specific antigen (ng/ml)	1.4	0.8	0.3 - 3.6

Table-2: Pearson's correlation coefficient and their significance levels for prostate volume

	Pearson's Correlation Coefficient I	p value
Age	-0.045	0.656
International prostate symptom score	0.191	0.57
Incomplete emptying (IE)	0.221	0.027*
Frequency (F)	0.18	0.073
Intermittency (I)	0.174	0.084
Urgency (U)	-0.067	0.506
Weak Stream (W)	0.026	0.794
Straining (S)	-0.079	0.434
Nocturia (N)	0.209	0.037*
Obstructive Symptoms (IE+I+W+S)	0.159	0.113
Irritative Symptoms(F+U+N)	0.166	0.099
Quality of life score	0.139	0.168
Maximum flow rate	-0.419	0.229

* p Value <0.05 (Significant)

The mean IPSS score was 23.5±2.8, 57.0% of the score was contributed by obstructive symptoms (Table-1). The single disease-specific QOL score was 5.2±0.6.There was no correlation found between the prostate volume and IPSS (r=0.191; p=0.57) (Fig.1) and QOL score (r=0.139; p=0.168) (Fig.2). It also had no correlation with age (r=-0.045; p=0.656) and Q_{max}(r=-0.413; p=0.229). Similarly, it had no correlation with individual component of IPSS but had weak correlation with incomplete emptying (r=0.221; p=0.027) and nocturia (r=0.209; p=0.037) (Table-2). The total score of IPSS had strong correlation with the single disease-specific QOL score (r=0.439, p=<0.001) (Table-3) but no correlation with Q_{max}(r=0.023, p=0.984). Similarly, QOL score had statistically significant but weak correlation with age (r=0.221, p=0.027). Incomplete emptying, intermittency, and nocturia had significant and good correlation with quality of life score(r=0.244, p=0.014; r=0.278, p=0.005; r=0.338, p=0.001).

Table-3: Pearson's correlation coefficient and their significance levels for quality of life score

	Pearson's Correlation Coefficient I	p value
Age	0.221	0.027*
International prostate symptom score	0.439	<0.001*
Incomplete emptying (IE)	0.244	0.014*
Frequency (F)	0.067	0.507
Intermittency (I)	0.278	0.005*
Urgency (U)	0.178	0.076
Weak Stream (W)	0.098	0.33
Straining (S)	0.069	0.493
Nocturia (N)	0.338	0.001*
Obstructive Symptoms (IE+I+W+S)	0.338	0.001*
Irritative Symptoms(F+U+N)	0.405	<0.001*
Prostate Volume	0.139	0.168
Maximum flow rate	-0.007	0.984

* p Value <0.05 (Significant)

DISCUSSION

BPH is a common histological condition among older men, which is intimately related to aging. Several different instruments have been developed to quantitate the severity of BPH symptoms in which IPSS is the one to be widely used.[2] In this study we assessed the patients using the same tool and determined that most of the patients had severe obstructive symptoms with poor quality of life. Almost comparable results had also been reported by Chung *et al*[2] Gacci *et al*[4] and Arvind *et al*[5] but with less severity.

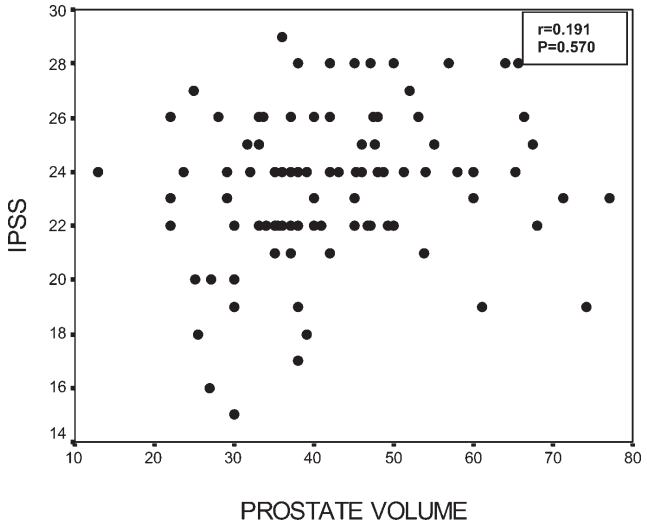

Fig.1. The correlation between prostate volume and International prostate symptom score

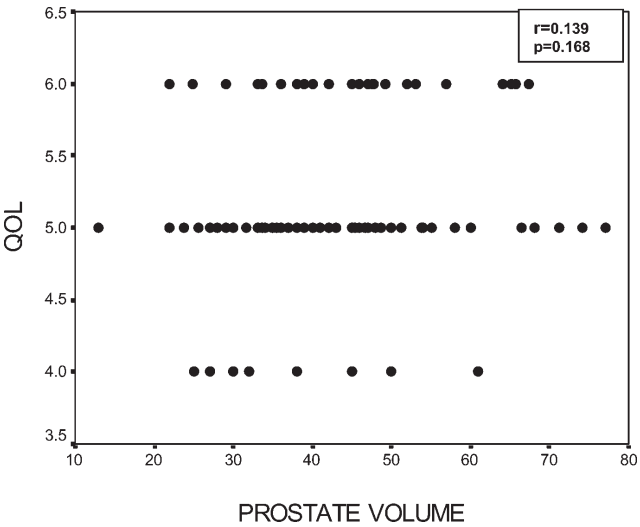

Fig.2. The correlation between prostate volume and quality of life score

An estimation of prostate volume is very useful in a variety of ways. It would help to decide upon the appropriate therapy and assist in the interpretation of serum PSA level for the presence of cancer.[6] Some authors used transabdominal ultrasonography to measure prostate size with accurate results; others felt this method had an inherent problem.[7] We found that the average prostate volume measure by this method was 42.5 cm^3, which was comparable to other study done by Vesely *et al*[8] (40.1 cm^3) and Dicuio *et al*[9] (41 cm^3).

In the present study, age of the patients had no correlation with prostate volume and IPSS and had significant but weak correlation with QOL score [Table3]. It reflects that the disease-specific quality of life reduces with ageing which may be due to bother associated with the enlarged prostate.

The relationships between prostate volume and IPSS in 803 patients have been described by Ezz *et al*[10] with no correlation detected. This data was further supported by our study, where no correlation was found in-between prostatic volume, and total and each component of IPSS [Table 2]. The exceptions were incomplete emptying and nocturia, with a marginally significant and weak correlation; but the clinical relevance of this finding is doubtful. Witjes *et al*[11] also reported that nocturia correlating weakly but significantly with prostate volume. Similarly prostate volume had no correlation with single disease-specific QOL score, which was also confirmed in various other series.[12,13] Statistically significant and good correlation was found between IPSS and QOL score, which was also supported by Lui *et al,*[13] Bosch *et al*[14] and Wadie *et* al.[15]

Thus, symptoms and bladder outlet obstruction are determined by many factors not only by prostate volume

alone. As the correlation between the prostate volume and IPSS is nil, the size of the prostate should not be an important consideration to determine the need for therapy. However, the choice of therapy depends on the size of prostate. Therefore, we should not treat the volume of prostate; it's the symptoms and poor uroflowmetric variables that should be treated off. If there is a severe symptoms associated with poor quality of life and a large prostate, it is likely that the prostate is the major cause of obstruction and therapy should be design to reduce the prostate volume medically or surgically. Reduction in prostate volume in this condition ameliorates the symptoms and improves the quality of life of the patients.

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