CORRELATION BETWEEN AGE, INTENSITY OF PROSTATE SYMPTOMS AND ULTRASONOGRAPHIC FINDINGS

Correlação entre idade, intensidade de sintomas prostáticos e achados ultrassonográficos

Correlación entre la edad, la intensidad de síntomas prostáticos y los hallazgos ultrasonográficos

ABSTRACT

Objective: *T*o investigate the association between the intensity of symptoms of lower urinary tract and the ultrasonographic findings in patients attending the urology outpatient clinic of a university hospital. **Methods:** Observational and cross-sectional study conducted at a university hospital in 2013, in which patients with clinical and ultrasonographic (USG) diagnosis of benign prostatic hyperplasia (BPH) were evaluated through direct interview, by applying a form that collected data such as age, aspects of the ultrasound report, and the quantification of symptoms, by means of the International Prostate Symptom Score (IPSS). The study applied the Kruskal-Wallis test, Spearman correlation, and one-way ANOVA, considering statistical significance level at p<0.05. **Results:** There was no statistically significant correlation between the variables prostatic volume (PV) and IPSS score (p=0.2), as well as between the variables IPSS score and age (p=0.19). However, there was a statistically significant correlation between the variables age and PV (p=0.03 and rho=0.34). **Conclusion:** The IPSS showed no statistically significant correlation with the prostate volume estimated by ultrasonography or with the patient's age, a suggestive fact that other variables may be involved in the outcome of this score.

Descriptors: Prostatic Hyperplasia; Ultrasonography; Symptoms.

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RESUMO

Objetivo: *Investigar a associação entre a intensidade dos sintomas do trato urinário baixo e os achados ultrassonográficos em pacientes atendidos no ambulatório de urologia de um hospital universitário.* **Métodos:** *Estudo observacional e transversal realizado em um hospital universitário no ano de 2013, em que pacientes com diagnóstico clínico e ultrassonográfico (USG) de hiperplasia prostática benigna (HPB) foram avaliados através de entrevista direta, por meio de aplicação de formulário com coleta de dados, como idade, aspectos do laudo ultrassonográfico e da quantificação dos sintomas através do Escore Internacional de Sintomas Prostáticos (IPSS). Aplicaram-se os testes Kruskal Wallis, Correlação de Spearman e ANOVA de uma via, considerando-se estatisticamente significativo p<0,05.* **Resultados:** *Não houve correlação estatisticamente significativa entre as variáveis volume prostático (VP) e pontuação do IPSS (p=0,2), assim como entre as variáveis pontuação do IPSS e idade (p=0,19). Contudo, houve correlação estatisticamente significativa entre as variáveis idade e VP (p= 0,03 e rho=0,34).* **Conclusão:** *O IPSS não mostrou correlação estatisticamente significativa com o volume prostático estimado pela ultrassonografia, nem com a idade do paciente, fato sugestivo de que outras variáveis podem estar envolvidas no resultado desse escore.*

Descritores: *Hiperplasia Prostática; Ultrassonografia; Sintomas.*

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RESUMEN

Objetivo: *Investigar la asociación entre la intensidad de los síntomas del tracto urinario inferior y los hallazgos ultrasonográficos de pacientes asistidos en el ambulatorio de urología de un hospital universitario.* **Métodos:** *Estudio observacional y transversal realizado en un hospital universitario en el año de 2013 con pacientes con el diagnóstico clínico y ultrasonográfico (USG) de hiperplasia de próstata benigna que fueron evaluados a través de una entrevista directa con la aplicación de un formulario con datos de la edad, los aspectos del informe de la ultrasonografía y de la cuantificación de los síntomas a través de la Puntuación Internacional de Síntomas Prostáticos (IPSS). Se aplicó las pruebas de Kruskal Wallis, Correlación de Spearman y ANOVA de una vía, considerándose estadísticamente significativo el p<0,05.* **Resultados:** *No hubo correlación estadísticamente significativa entre las variables del volumen prostático (VP) y la puntuación del IPSS (p=0,2) así como entre las variables puntuación del IPSS y la edad (p=0,19). Sin embargo, hubo correlación estadísticamente significativa entre las variables edad y VP (p=0,03 y rho=0,34).* **Conclusión:** *El IPSS no mostró correlación estadísticamente significativa con el volumen prostático estimado en la ultrasonografía ni con la edad del paciente, hecho que sugiere que otras variables pueden estar involucradas en el resultado de la puntuación.*

Descriptores: *Hiperplasia Prostática; Ultrasonografía; Síntomas.*

INTRODUCTION

Since 2009, Brazilian Unified Health System (*SUS - Sistema Único de Saúde*) has a specific policy for men's health promotion, in order to encourage greater inclusion of men in health services. The entrance door is the Primary Care, which operates on the most prevalent diseases[1]. However, benign prostatic hyperplasia (BPH), an extremely common condition, is not properly covered by the National Policy for Comprehensive Attention to Men's Health[2]. BPH is characterized by a non-cancerous prostate enlargement. This is an important pathological condition and the second cause of surgical intervention in elderly men. Age, heredity and testicular function are risk factors[3].

Symptoms are initially discreet, gradually compromising the quality of life, and are classified as obstructive and irritative. The first ones are: difficulty to start the urine stream (hesitancy), voiding difficulty and effort, weak and thin urinary stream, and the presence of post-voiding residual urine due to incomplete bladder emptying. The latter are the difficulty or inability to control urine, waking up several times at night to urinate (nocturia), and urinating several times a day (polyuria)[4]. These changes appear basically in result of three pathological mechanisms: prostatic bladder outlet obstruction, bladder muscle response (detrusor) to obstruction and to prostate-generated neural stimuli[3].

Strictly speaking, men over forty years or with urinary symptoms should be evaluated by a health professional about the possibility of BPH. The patient must first respond to the International Prostatic Symptom Score (IPSS)[5], which stratifies the symptoms through a questionnaire consisting of questions focused on the frequency of seven of the main symptoms associated with the disease. Then is performed the digital rectal exam, which helps to evaluate the possibility of prostate cancer and estimates the gland volume, a fundamental feature for therapeutic decision-making[1]. Following that, the doctor must request complementary examinations, such as prostate-specific antigen (PSA), renal function, and ultrasonography[1]. The latter describes more accurately the prostatic volume and allows to assess the extent of post-voiding residue, which evidences impaired detrusor muscle when above 150 ml; its report classifies the prostate volume into normal (20g) or enlarged (above 20 g)[6].

When symptoms are moderate to severe, people affected by BPH have their quality of life compromised, as there an impact on physical and mental health, with performance limitation in daily activities, sleep pattern changes, and deterioration of sexual function[7]. Therefore, bearing in mind that this is a very common disease, with a relatively simple diagnosis[1], it is essential that professionals who work in Basic Health Units (BHU) recognize which BPH patients do need to undergo an evaluation performed by a Urology specialist, thereby optimizing costs and time. An example comes from the Primary Care in Spain, where men over 50 years are screened for BPH with a specific protocol[8]. In Brazil, there are few protocols to facilitate screening and intervention at the primary level, which would contribute to proper referral to the urologist.

Faced with the propaedeutic investigation for BPH, which involves anamnesis with application of IPSS, physical screening with rectal examination, and ultrasound for the measurement of prostate volume and post-voiding residue, it is important to know if there is a significant correlation between these parameters, aiming at the reduction of costs related to test requests. Based on the above, this study aimed to investigate the association between the severity of symptoms of lower urinary tract and the ultrasonographic findings in patients attending the urology outpatient clinic of a university hospital.

METHODS

The present study followed an observational and cross-sectional model. The sample, selected in a non-probabilistic way, by convenience, consisted of patients with an

established diagnosis of benign prostatic hyperplasia, seen at the Urology outpatient clinic of the Lauro Wanderley University Hospital (*HULW - Hospital Universitário Lauro Wanderley*) in João Pessoa, Paraíba, from May to August 2013.

Patients who had done abdominal or transrectal ultrasonography and agreed to participate by signing the Free and Informed Consent Form were selected for the study. The exclusion criteria for this study were: patients who refused to sign the Consent Form; who had undergone prior prostate or bladder surgery; patients with urethral stricture or neurogenic bladder dysfunction; making use of alpha-blocker or 5-alpha-reductase inhibitor; ultrasound examination performed more than six months prior to the data collection; or absence of prostate weight evaluation by ultrasonography.

The study used the direct interview technique with the patient, through the application of a form and the International Prostatic Symptom Score (IPSS) questionnaire for data collection. For calibration of the interviewer, a medical student who had already taken a course in Urology and was trained for data collection by a PhD. Professor of Urology performed a pretest assessment in five patients to observe operational problems and correct possible methodological errors. On the form, were recorded the variable age and the ultrasonography report issued by the radiologist in charge. Permission to record information

was given by the institution and the patient, by signing the consent forms. Quantification of symptoms was performed using the IPSS (Chart 1).

From the obtained data, patients were classified into three groups, according to the total score: mild symptoms (0 to 7 points), moderate symptoms (8 to 19 points) and severe symptoms (20 to 35 points).

For statistical analysis, the study used the SPSS 19.0 software for Windows, using Shapiro-Wilks tests to assess the normality of the variables prostatic volume and age, Kruskal Wallis to evaluate the correlation between prostatic volume and the IPSS (grouped into mild, moderate, and severe symptoms), and Spearman correlation to evaluate the correlation between age and prostatic volume. One-way ANOVA was used to assess the degree of correlation between IPSS and age.

This study was approved by the Research Ethics Committee of HULW, under Opinion No. 261262.

RESULTS

The sample consisted of 42 patients with mean age of 59.5 years ± 10.8 and prostatic volume of 52 ml/cm ± 22.3. There was a prevalence of patients with moderate symptoms, followed by the ones with severe and mild symptoms (Table I).

Chart 1 - International Prostatic Symptom Score (IPSS).

	0	Up to 5	Up to 14	15	Over 15	Almost always
Over the last month, how often have you had the sensation of not emptying your bladder?						
Over the last month, how often have you had to urinate less than every two hours?						
Over the last month, how often have you found you stopped and started again several times when you urinated?						
Over the last month, how often have you found it difficult to postpone urination?						
Over the last month, how often have you had a weak urinary stream?						
Over the last month, how often have you had to strain to start urination?						
Over the last month, how many times did you typically get up at night to urinate?						
Total score						

Source: Emberton M, Cornel EB, Bassi PF, Fourcade RO, Gómez JMF, Castro R. Benign prostatic hyperplasia as a progressive disease: a guide to the risk factors and options for medical management. International Journal of Clinical Practice. 2008;62(7):1076-1086.

Table I - Severity of symptoms according to the International Prostatic Symptom Score (IPSS). João Pessoa, PB, 2013.

IPSS	Number of patients	Frequency
Mild	11	26.2 %
Moderate	16	38.1 %
Severe	15	35.7 %

There was no statistically significant correlation between the variables prostatic volume and IPSS (p=0.2), as well as between the variables IPSS and age (p=0.19).

However, there was a statistically significant correlation between the variables age and prostatic volume (p=0.03 and rho=0.34) (Table II).

Table II - Correlation between prostatic volume, International Prostatic Symptom Score (IPSS) and age. João Pessoa, PB, 2013.

Correlations	p value
Prostatic Volume X IPSS	0.2
IPSS X Age	0.19
Age X Prostatic Volume	0.03

DISCUSSION

In this study, BPH (benign prostatic hyperplasia) affects men with an average age of 59.5 years and a mean prostatic volume of 52 g. Other studies point to average ages of 62.5 years[9] and 53.8 years[10]. There is a wide agreement on the close relationship between the disease and age, so that it can affect up to 90% of patients older than 80 years[11]. One study estimated an average prostatic volume of 43.8 g in patients suffering from non-cancerous prostate tumours, group in which BPH is present[12]. Another study, conducted with 155 patients with BPH, showed average prostatic volume of 42.9 g[13].

Benign prostatic hyperplasia is a complex and progressive disease in men. It is commonly associated with lower urinary tract symptoms and may result in complications such as acute urinary retention and need for surgery, thus compromising men's quality of life[4].

Therefore, a close relationship between age and increased prostatic volume suggests that people aged 60 and above are at higher risk for the development of BPH. From this perspective, health services, especially primary care, should develop preventive measures that allow the early identification of men at higher risk for BPH, with the objective to optimize the therapeutic approach[5] and minimize hazards to men's health.

In the present study, the majority (38.1%) of the studied patients had symptoms quantified as moderate by the IPSS, followed by severe and mild conditions. A study in Santa Catarina with 155 patients with BPH showed prevalence of moderate symptoms, with average of 11.9 points[13], which corroborates the results of the current investigation. The predominance of moderate and severe symptoms suggests that men with BPH are being diagnosed when the disease is already advanced, thereby hampering the therapeutic approach, increasing health costs, and causing damages, sometimes irreversible, to the quality of life of men[13].

Initially composed of a triad – prostate volumetric enlargement, symptoms of lower urinary tract, and bladder outlet obstruction[14] – the intravesical prostatic protusion is directly involved in the determination of BPH urinary symptoms[15]. This is explained because the enlarged prostate starts to function as an obstructive valve, preventing the emptying of the bladder. The glandular growth itself undermines the volumetric capacity of the bladder, triggering the emergence of symptoms such as pollakiuria, nocturia, and micturition urgency, which affect the patients' quality of life[16,17]. This condition is often worsened by the aging process and existing comorbidities, since the older the patient, the greater the risk of developing BPH[15].

It is known that an effective way to combat the symptoms of BPH is prevention, by addressing the risk factors for the disease[18]. Even though non-unmodifiable risk factors such as age, genetics, and geography play important roles in BPH etiology, recent data has shown that modifiable risk factors are associated with disease prevention and relief of symptoms, including obesity, diabetes, diet, physical activity and inflammation[18]. Studies published in South Korea suggest that weight loss and regular physical activity could be useful for the symptomatic relief of BPH[19,20].

The significant difference in life expectancy between men and women suggests that the former are a more vulnerable group in need of targeted health promotion programs, acting on modifiable risk factors in order to make the man involved with his health or disease management[21]. Therefore, the evidence of this study suggests that the management of patients with symptoms of lower urinary tract is multifactorial and Primary Care has a key role in prevention and early detection of BPH, essential for assurance of quality of life to men.

This study showed that neither age nor prostate volume have statistically significant relationship with IPSS. In a study held in Sweden, it was concluded that there is no statistically significant correlation between the IPSS and prostate volume, nor between the IPSS and age[22]. A recent study suggested that isolated increases in the IPSS should not be used as a BPH predictor[14]. Other studies[13,15,21]

found no significant correlation between the IPSS score and age or between the IPSS and prostate volume - results that have also been demonstrated by this study.

During the consultation, aspects of the IPSS and the estimated prostate volume need to be assessed, including by means of ultrasonography, which is an exam of low cost and increasing availability[23] in public health services. On the other hand, it was demonstrated that ultrasonography can overestimate the size of the prostate by 30%. Transrectal ultrasonography is better in defining size; however, its invasive nature limits its routine use[24].

Considering that, it is not enough to analyze quantitatively the HPB parameters. Those must be linked to the risk factors that can be prevented or mitigated by health promotion to man through Primary Care, which allows us to identify more accurately which patients require specialized evaluation, and even more aggressive treatment, through surgical procedure[21].

Despite the limitations resulting from the small sample of patients analyzed and the subjectivity of symptoms quantification, inherent to the IPSS, the evidence of this study suggest that a simple application of the questionnaire in men with suspected BPH is not enough to form the diagnosis. The patient should undergo a more comprehensive clinical interview addressing the uniqueness of each symptom and its impact on man's quality of life.

CONCLUSION

In this study, the International Prostatic Symptom Score (IPSS) showed no statistically significant correlation with prostatic volume estimated by ultrasonography nor with the patients' age.

It is suggested that other variables relating to the individual, beyond the simple increase in prostatic volume, may be involved in the development and severity of symptoms, and that the approach to these patients must be comprehensive and integral, in order to avoid unnecessary costs, optimize treatment, and minimize the disease impact on human health.

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