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Contribution of Diagnostic Tests and Drug Therapy in Screening of Benign Prostatic Hyperplasia (BPH) in Western Algerian Hospital

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Abstract

The incidence of benign prostatic hyperplasia (BPH) is known through the American and European continents whereas it remains much to make to know the epidemiologic profile of this pathology in Algeria. This study aims to show a contribution of diagnostic tests and drug therapy in screening of BPH in Western Algerian hospital. Our study was carried out on 385 men recruited in the Urology department of Saida hospital during the period 2010-2013, consulting for urologic problems whose 120 patients, aged between 45-84 years, have BPH. BPH frequency was 31.1 %. It was prevalent in the age – specific range of 65-74 years. The physical, biological and histological examinations revealed that 75 % of the patients were diagnosed by digital rectal examination (DRE), 70 % have serum-TPSA level lower than 4 ng/ml and 71.2 % have a histological type named "prostatic hyperplasia adeno-fibro-Leio myomatic (or PHAFLM)". As for an assumption of responsibility concerning BPH patients 52.7 % have chosen a medical treatment. This work showed the proportion of the subjects carrying BPH in this area of Algeria. This study provides information on the incidence of BPH in this area of Algeria. But more work needs to come to reinforce the results to uncover the various risk factors (age, race, diet, hormones) that are behind the development of this disease.

Keywords: Incidence; benign prostatic hyperplasia; urology; TPSA.

Introduction

Benign prostatic hyperplasia (BPH) is a common urological disease in older men. BPH, known as nodular hyperplasia, is a disease characterized by histological changes in the prostate gland [1]. The mechanism underlying the pathogenesis of BPH remains largely unidentified. Age and androgens are established risk factors for the development of BPH [2]. According to studies carried out in France, 21% of men older than 50 years had lower urinary tract symptoms of varying severity associated with BPH [3-5]. Epidemiological studies of BPH in the United States have shown that the incidence of BPH increased from 18 cases / 100000 to 1670 / 100000 habitants among men aged between 75-79 years [6]. The prevalence of BPH is difficult to quantify but it is a common cause of surgery. The main risk factors for BPH etiology remains unknown [6, 7]. This

pathology is very common among black men and less common among Asians than Caucasians [7, 8]. In Algeria, particularly in the area of Saida located in the west of the country, no epidemiological data were recorded. The objective of this study was to indicate a contribution of diagnostic tests and drug therapy in screening of BPH in Western Algerian hospital.

Methods

Design study. A retrospective study was carried out on 385 men recruited in the urology department of the Saida hospital during the period 2010-2013. It was recorded 120 cases of BPH older than 40 years consulting for urological disorders. The study of medical records, based on the report of the pathologist, had confirmed histologically on surgical specimens from biopsies and prostatectomy, the existence of a benign tumor. The inclusion criteria were: patients gave their written consent for their medical records, patient with BPH free of any other prostatic disease, all BPH patients resident in the area of Saida and having undergone the same method of serum-prostate specific antigen PSA assay. Whereas exclusion criteria were patients with prostate cancer associated with BPH, different methods of serum-PSA assay were followed by BPH patients, and patients living outside the province of Saida. The anamnesis was performed systematically in BPH patients, to collect all data on demographics and medical history. BPH patients were matched by age, physical examination, determination of serum total prostate specific antigen (TPSA), ultrasound and histological examinations. This study was approved by the scientific committee of LREH (Laboratory of Research in Environment and Health) of Sidi-Bel-Abbes University Hospital (located in Western Algeria).

TPSA serum-assay. All patients were evaluated by determination of the TPSA-serum level. Blood samples were collected at the urology department in Saida hospital and taken directly to the laboratory of biological analysis in the same hospital. Approximately 10 ml of blood were collected intravenously in a dry tube. The blood was centrifuged and serum was frozen at -20°C until to be used in the assay. The sera were frozen for a period not exceeding three months and then thawed for achieving TPSA assay knowing that for short periods of freezing and TPSA assay is little changed. TPSA assays are undergone in mini VIDAS analyzer (bio-Merieux, Lyon France). The used method was the technique of enzyme-linked fluorescent assay (ELFA): it is an enzyme immunoassay ELISA (*enzyme-linked immunosorbent assay*) "sandwich" in heterogeneous phase where the molecules of PSA are caught between two monoclonal antibodies of murine nature. Reading results of the TPSA assay is done in two stages to a final detection by fluorimetry. The cut-off of TPSA is 4 ng / ml, prescribed by the kit supplier. The detection limit of this method is 0.07 ng / ml and the range of the VIDAS-TPSA kit extends to 100 ng / ml. Samples, with concentrations of TPSA over 100 ng / ml, were retested after dilution in sample diluent TPSA (calf serum + sodium azide 0,9 g/l).

Histological study. At Urology Department, Samples of prostate tissue were fixed in 10 % formalin and sent to the Pathology Department for microscopic examination. These samples were processed according to the conventional histological techniques. Surgical specimens, fixed in formalin, were cut into thin slices about 3 mm. The paraffin embedding technique was the method of treatment of these fragments, the slides are stained with hematoxylin and eosin and observed under optical microscope from a low to high magnification.

Statistical analysis. The SPSS *version 11.5* software was used in this study for all statistical analyzes. Comparison of age-ranges (ie 5 groups of age) was performed by the ANOVA test to reveal significant differences at $\alpha < 0.05$.

Results

This study determined the frequency of BPH (31.1 %). The results showed that BPH was present in all age ranges with highly significative differences ($p^{**} < 0.01$). It was found that this disease was predominant in 44 patients aged 65 to 74 years, whereas only 14 patients aged 84 years and over (Table 1).

Table 1: Age-specific prevalence of BPH

Age (years)	Patients (Total)	Patients (N) BPH	Frequency (%)	<i>p-value</i>
45-54	22	07	5.83**	<i>p</i> < 0.01
55-64	80	25	20.83	
65-74	141	44	36.66**	
75-84	96	30	25.00	
> 84	46	14	11.68	
Total	385	120	100	

** : Highly significant difference (*p* < 0.01).

The comparison of results from different screening tests for diagnosis BPH showed that 75 % of patients (90 / 120) were diagnosed by DRE, 71 % (85 / 120) by ultrasound and 56.66 % (68 / 120) by serum-TPSA assay while only 37.5 % (45/120) patients underwent pathological examination (Figure 1).

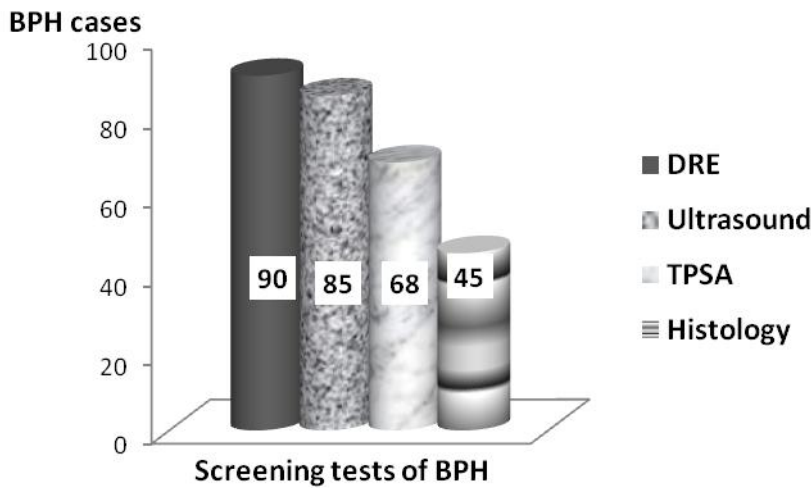


Figure 1: Different screening tests of BPH

In a population of 120 BPH patients, only 68 men have undergone an enzyme immuno-assay TPSA. Among them, it was found that 70 % having TPSA < 4 ng / ml, 25% with TPSA between 4-10 ng / ml, whereas only 5 % with TPSA > 10 ng / ml (Figure 2).

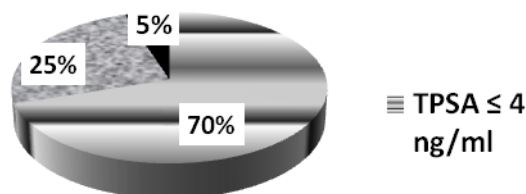


Figure 2: TPSA proportions in BPH patients

The histological type "prostatic hyperplasia adeno-fibro-Leio myomatic (or PHAFLM)" was the predominant type in 71.25 % of BPH patients, while the other prostatic histological types "true adenoma (or TA)" and "nodular hyperplasia (or NH)" were moderately represented by the respective proportions of 16.56 and 12.19 % (Figure 3).

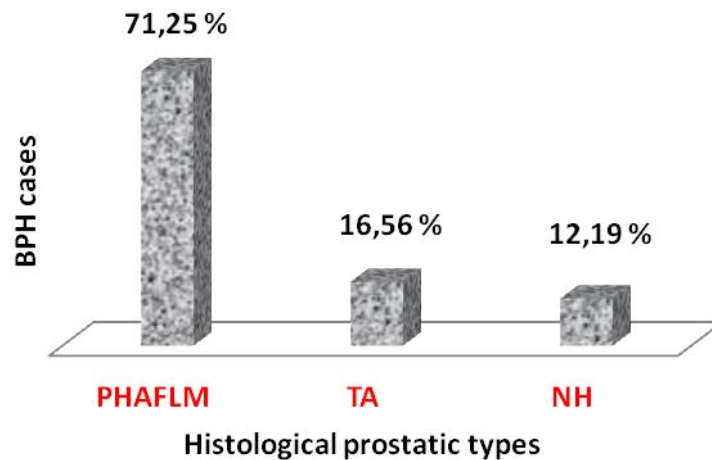


Figure 3: Histological prostatic types in BPH patients (PHAFLM: prostatic hyperplasia adeno-fibro-Leio myomatic, TA: True adenoma, NH: Nodular hyperplasia)

More than half of BPH patients (ie 52.5 %) received a drug therapy. The prostatectomy was applied to patients who have had a failure with medical therapy (ie 37.5 %), while just in 9.8 % of patients, their medical treatment was unknown because the consultation of their medical records revealed that their files contained no descriptive listing on therapeutic monitoring and also after a discussion with these patients it turned out they did not like to take drug (Table 2).

Table 2: Medical treatment of BPH

Types of therapy	Patients (N)	Frequency (%)
Drug therapy		
Tadenant 50 mg	33	27.5
Permixon 160 mg	30	25
Surgical treatment		
Prostatectomy	45	37.5
Unknown medical treatment	12	9.8

Discussion

Benign Prostatic Hyperplasia (or BPH) is a histological entity characterized by a stromal cell hyperplasia [9]. Little reliable epidemiological data are available to us today [10]. The current estimate of the BPH incidence in western countries is 10 per 1000 patients per year in the fifth decade and is growing at 60 per 1000 patients per year in the eighth decade [11]. Similarly, it is estimated that the prevalence of BPH was 14 % in the fifth decade and reached 40 % in the eighth decade [11]. The predominant epidemiological factor is age, as has been demonstrated on large autopsy series. Hormonal status appears to play an important role [12]. Other factors (environmental, food, sexual habits, marital status and tobacco) have sometimes been invoked but no scientific basis has demonstrated involvement in the development of BPH [13]. The present study presented retrospective elements of BPH and allowed to determine the frequency of this disease in a group of patients old in range of 45-84 years (31.1 %). The increase in age, beyond 50 years, is the predominant cause for the occurrence of BPH. The incidence of BPH, determined in our study, was lower than those found in the study of Baltimore, underwent on a population of 500 men, which showed 39 % of men aged 60 and over were BPH [14, 15] and in the work of Akindes performed on a group of 66 patients revealed the presence of 81.6 % of BPH [14]. The age-specific

prevalence for our patients reached a maximum of 36.6 % in the age range 65-74 years, which is double that found in the results of Watanabe (18 %) for patients with the same age [14, 16]. The digital rectal examination (or DRE) does not allow an accurate assessment of prostate size. It underestimates the size of the prostate adenoma in 25-55 % of men with prostate greater than 40 grams. It is more reliable for smaller prostates. In case of the BPH, the volume of prostate gland seems increased at two lobes but the prostate remains soft, smooth, homogeneous and indolent. But in our study, DRE is a valuable contribution and allowed diagnose BPH in 75 % of patients, results corroborate those of Waligora which show that 79 % of patients with BPH were detected by DRE suggesting BPH is the most common prostate tumor [14, 17]. When urological disorders have been reported in BPH and a surgical treatment is considered, it becomes essential to reliably determine the size of the adenoma by ultrasound to first choose the surgical route (prostatectomy). PSA is not specific for prostatic tumors. An elevation of PSA was observed in case of prostate cancer, but also in BPH, prostatic inflammation and urinary infection. The screening includes a PSA and DRE, conducted annually. PSA alone is not sufficient screening because 5 to 10 % of cancers, detected with a DRE, have a normal PSA at first [18]. The normal PSA value for the diagnosis of cancer most often used is 4 ng / ml [19]. The average concentration of the TPSA, in our study, was 3.75 ng / ml. As stated by Teillac [14, 20, 21] in his work on 600 patients (France, 1990), the serum-TPSA levels in 5 % of our patients (TPSA > 10 ng / ml) showed that PSA could not be a specific tumor marker for prostate cancer. The biological tumor marker, PSA, draws attention to prostatic pathology from a serum-TPSA > 10 ng / ml while a TPSA > 50 ng / ml is suspect the presence of prostate cancer. The histological type "prostatic hyperplasia adeno-fibro-Leio myomatic (or PHAFLM)" is the predominant lesion, almost non-existent in the young, but extremely common at age 50, reaches 50 to 60 % of men aged between 40-59 years and 95 % after 70 years. It as an essential clinical translation, often partial obstruction of the prostatic urethra and requires in 5-20 % of cases surgery to remove urinary obstruction [22]. Nodular hyperplasia (or NH), as well as other benign prostate pathologies, may be accompanied by an increase in serum-PSA. Surgical treatment of BPH should bring the PSA at a normal serum concentration. The persistence of a high level of PSA after surgery, should suggest a latent prostate cancer [22]. Herbal medicine has been used for a long time, especially in Europe. These drugs definitely improve symptoms in some patients but the mechanisms of action have not been sufficiently studied. They are described anti-edematous effect and prostatic congestion [23]. The products used in the treatment of BPH are extracts of pygeum africanum (Tadenan ®) and Serenoa repens (Permixon ®). The prescription must be isolated without association to another medical therapy of BPH [23].

Conclusion

BPH is a common affection and under-diagnosed in this area of western Algeria. An early detection of this pathology among men aged over 50 years with urinary tract symptoms, help prevent complications of BPH and improve the quality of life in patients. Screening of BPH, in Western Algeria, based on clinical and para clinical parameters and relies on different types of therapy including surgery and herbal medicine. If diagnosis of BPH was early then prostatectomy remains unmatched to the other diagnostic tests. It is best to initiate further studies in the future to better assess the incidence of BPH on the basis of age and other risk factors such as androgens, food and family history of BPH.

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Conflict of interest statement

The authors declare that they do not have any conflict of interest.

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