THE CORRELATIONS AMONG COMPONENTS OF METABOLIC SYNDROME, PSA, AND PROSTATE VOLUME IN BPH PATIENTS

[1]Yanuar Wicaksana Sumasta, [1]HR Danarto.

[1]Division of Urology/Department of Surgery, Faculty of Medicine/Gadjah Mada University, Sardjito General Hospital, Yogyakarta.

ABSTRACT

Objective: *This study was to evaluate the associations among metabolic components, prostate specific antigen (PSA), and prostate volume (PV) in benign prostate hyperplasia (BPH) patients.* ***Material & method:*** *During the period from January 1, 2010 to August 31, 2013, 61 mens were diagnosed with BPH were enrolled. PV by transabdominal ultrasonography of the prostate, serum PSA, metabolic syndrome (MS) related parameters were investigated. MS was defined according to the modified National Cholesterol Education Program Third Adult Treatment Panel Guidelines. We evaluated the correlation between PSA, PV and MS components using Spearman's test and Independent t test.* ***Results:*** *PV were not correlated with MS criteria (p = 0.591) PSA total also were not correlated with MS criteria (p = 0.305). PV were not correlated with each components MS; cholesterol total (p = 0.593), trigliserid (p = 0.479), HDL (p = 0.702), LDL (p = 0.512), blood glucose (p = 0.317). PSA total were not correlated with each components MS; cholesterol total (p = 0.255), trigliserid (p = 0.543), HDL (p = 0.446), LDL (p = 0.615), blood glucose (p = 0.987).* ***Conclusion:*** *There were no associations among metabolic syndrome criteria and each components, prostate volume and PSA total.*

Keywords: *Prostate specific antigen total, prostate volume, metabolic syndrome, benign prostate hyperplasia.*

ABSTRAK

Tujuan: *penelitian ini bertujuan untuk mengevaluasi hubungan antara komponen metabolik, prostate specific antigen (PSA), dan volume prostat (VP) pada pasien benign prostate hyperplasia (BPH).* ***Bahan & cara:*** *Selama periode 1 Januari 2010 sampai 31 Agustus 2013, terdapat 31 pasien laki-laki yang didiagnosa dengan BPH. VP dengan ultrasonografi transabdominal prostat, serum PSA, sindrom metabolik (SM) yang berhubungan dengan parameter diteliti. SM didefinisikan berdasarkan Guideline National Cholesterol Education Program Third Adult Treatment Panel yang sudah dimodifikasi. Kami mengevaluasi hubungan antara PSA, VP, dan komponen SM dengan menggunakan tes Spearman dan tes t-independen.* ***Hasil:*** *VP tidak berhubungan dengan kriteria SM (p = 0.591), total PSA juga tidak berhubungan dengan kriteria SM (p = 0.305). VP tidak berhubungan dengan setiap komponen SM; total kolesterol (p = 0.593), trigliserid (p = 0.479), HDL (p = 0.702), LDL (p = 0.512), gula darah (p = 0.317). Total PSA tidak berhubungan dengan setiap komponen SM; total kolesterol (p = 0.255), trigliserid (p = 0.543), HDL (p = 0.446), LDL (p = 0.615), gula darah (p = 0.987).* ***Simpulan:*** *Tidak didapatkan hubungan antara kriteria sindrom metabolik dan setiap komponen, volume prostat dan total PSA.*

Kata kunci: *Total prostate specific antigen, volume prostat, sindrom metabolik, benign prostate hyperplasia.*

Correspondence: Yanuar Wicaksana Sumasta; c/o: Division of Urology/Department of Surgery, Faculty of Medicine/Gadjah Mada University, Sardjito General Hospital Yogyakarta. Jl. Kesehatan No. 1, Yogyakarta. Phone: +62 274 587333; Fax: +62 274 543980, Mobile phone: 081804208467. Email: astalogy@gmail.com.

INTRODUCTION

Benign prostate hyperplasia (BPH) as one of the growth of the prostate gland, develop in accordance with the age of every male beginning at the age of 40 years. Clinically, BPH is an enlargement of the prostate gland that caused symptoms of obstructive and irritating. Risks to be taken prostatectomy at the age above 50 years to reach 40%.[1]

BPH histopathologically showed hyperplasia of stromal and epithelial tissues. It has been

more than a few hundred years, there are two unknown etiology and pathogenesis of BPH, it is androgen and aging. Some risk factors such as family history, ethnicity, smoking, diabetes mellitus, increased high-density lipoprotein (HDL), high blood pressure, and obesity increase the incidence of benign prostate enlargement. Multiple studies analyze the correlation between metabolic syndrome and prostate volume (PV). Some studies indicate that some cardiovascular disease risk factors such as elevated levels of fasting glucose, diabetes mellitus, obesity, and metabolic syndrome (MS) may also increase the risk of BPH and potentially on its development.[2]

MS is a combination of several metabolic and physiological abnormalities in an individual, including obesity, insulin resistance, glucose intolerance, hypertension, and dyslipidemia. All of it associated with increased mortality and morbidity. MS in addition to being a risk factor of cardiovascular disease, is also associated with the incidence of breast cancer, pancreas, and colon. Some research reports that the components of the MS are risk factor of BPH and prostate cancer. Several studies have reported obesity is associated with decreased prostate specific antigen (PSA) and PV. This study even delay for prostate biopsy. However the relationship between the components of the MS and PSA levels and PV is not certain.[3]

Our aim was to determine the correlation between MS, PSA and PV in patients with benign prostate enlargement so that we could know whether it is necessary to check PSA and PV measurements in male patients with MS.[4]

OBJECTIVE

This study was to evaluate the associations among metabolic components, PSA and PV in BPH patients.

MATERIAL & METHODS

Our inclusion criteria were patients diagnosed with benign prostate enlargement, examined components of the metabolic syndrome, examined PSA, and patients who underwent PV measurement using transabdominal ultrasonography and TURP surgery.

Our exclusion criteria were patients with histopathologic results of prostate malignancy (adenocarcinoma), Patients who underwent treatment of benign prostate enlargement with watchful waiting and medical, and Patients who have undergone previous treatment of MS.

All data were taken from patients with BPH who underwent inpatient at Sardjito General Hospital starting from January 2010 until August of 2013. Samples were taken from 61 patients with BPH who underwent TURP hospitalization and surgery in the Department of Dr. Sardjito from January 2010 to August 2013. The data were collected retrospectively by analyzing the status of hospitalized patients. Data collected include basic data such as age, sex, occupation, health insurance. The main data included the status of blood pressure, lipid profile, glucose level, PSA and PV. The diagnosis of MS following the panel criteria from the National Cholesterol Education Program.

This study was a retrospective study with correlation analysis. Data were analyzed using the Spearman test to see the correlation between the components of the MS with PSA and PV. Analysis was also conducted independent t-test to see the correlation between MS criteria with PSA and PV.

RESULTS

From January 2010 to August 2013, there were 61 subjects who were diagnosed with benign prostate enlargement that are included in the inclusion criteria. Subjects were taken basic data on lipid profile, prostate volume, and total PSA prior to treatment either medical therapy or surgical therapy (Table 1).

Table 1. Subject characteristic.

Variable	Mean
Age	67.31
Prostate Volume	47.78
Total PSA	20.53
Total Cholesterol	178.95
Trigliserida	147.01
HDL	38.38
LDL	111.36
Glucose level	124.21

Table 2. Characteristic of the MS and non-MS.

Criteria	n	%
Metabolic Syndrome	29	47.5
Non Metabolic Syndrome (non-MS)	31	52.5

Table 3. Correlation among PV with components of the MS.

Prostate	Metabolic Syndrome Component	P	
Volume	Total Cholesterol	0.593	> 0.05
	Trigliserida	0.479	> 0.05
	HDL	0.702	> 0.05
	LDL	0.512	> 0.05
	Glucose Level	0.317	> 0.05

Table 4. Correlation among PSA levels with MS components.

Prostate	Metabolic Syndrome Component	P	
Total PSA	Total Cholesterol	0.255	> 0.05
	Trigliserida	0.543	> 0.05
	HDL	0.446	> 0.05
	LDL	0.615	> 0.05
	Glucose level	0.987	> 0.05

Based on the criteria of the MS according to the National Cholesterol Education Program-Adult Treatment Panel III-American Heart Association/National Heart, Lung, and Blood Institute of the whole subject, a total of 29 (47.5%) patients were in the category of MS, while 32 (52.5%) patients were not included in the criteria for MS (Table 2).

Data analysis was then performed to see there a relationship between PV and total PSA of the components of MS. Data were analyzed using Spearman's test. Based on data analysis, it was found that, the PV was not statistically associated with the individual components of MS such as total cholesterol (p = 0.593), trigliserida (p = 0.479), HDL (p = 0.702), LDL (p = 0.512), and blood sugar levels (p = 0.317) (Table 3).

The results of the analysis of total PSA levels are also not statistically associated with the components of MS such as total cholesterol (p = 0.255), trigliserida (p = 0.543), HDL (p = 0.446), LDL (p = 0.615), and glucose levels (p = 0.987) (Table 4). Because the MS is a collection of symptoms that became a criterion, so then the data analyzed to see if there is relationship between PV and total PSA levels at diagnosis of the MS. Data analysis was conducted by examining the average mean of the total research subjects and the data analyzed using independent t-test.

The results of data analysis showed that there was no significant relationship between PV with a diagnosis of MS (p = 0.591). Also not found a statistically significant association between total PSA levels with a diagnosis of MS (p = 0305).

DISCUSSION

Benign prostate enlargement is a degenerative condition that occurs in men over 50 years of age. This condition affects the quality of life of the man directly.[5] Several studies have shown that benign prostate enlargement associated with multiple etiologic factors that influence the pathophysiology of prostate enlargement. The study is considered that many components of the metabolic syndrome such as central obesity, hypertension, diabetes mellitus, low HDL levels, and hypertrigliseda is a risk factor of prostate enlargement and even play a role in pathophysiology.[3] Hammarsten and Hogstedt reported that metabolic syndrome significantly affect the average size of the prostate and prostate growth rate compared with men who do not suffer from benign prostatic enlargement.[6] In this study, there was no statistically significant association between prostate volume with metabolic syndrome as well as the components of the metabolic syndrome, but not assessed a mean increase in prostate volume per unit time.

The average prostate volume was 47 grams which means there has been a benign prostate enlargement. Metabolic syndrome associated with various metabolic conditions and cardiovascular disease.[7] Research on the relationship between age and the metabolic syndrome, there are about 43.5% at the age of 60-69 years. Almost similar, benign prostate enlargement founded in men above 50 years of age. Approximately 60% of men over age 50 years have evidence of anatomic pathology occurrence of

benign prostate enlargement and increased to 80% at the age of 70 years.[8] In this study, the average age of the sample was 67 years old whose age were frequent finding of benign prostate enlargement. Half of the study subjects suffering from metabolic syndrome. Previously, benign prostate enlargement focused with the relationship between genetic and hormonal factors. Several theories were developed dehidro-testoteron-testosterone (DHT) theory and mesen-chymal-epithelial tissue interactions required in the growth of the prostate.[9]

Several risk factors such as insulin benign prostate enlargement, insulin-like growth factors (IGFs) and dyslipidemia are also influential in androgen-independent mechanism. Prostate-specific antigen (PSA) serum is a screening tool that is widely as an early marker to detect prostate cancer and is used as the management after the diagnosis of benign prostate enlargement enforced. PSA serum is influenced by several factors such as prostate volume, body mass index, and prostate disorders. Han et al reported a positive relationship between elderly men, diastolic blood pressure, and PSA serum levels, whereas body mass index, HDL and fasting blood sugar levels are not associated with serum PSA levels.[6] In this study, serum levels of total PSA was not significantly associated with metabolic syndrome and its components. However, the condition of benign prostate enlargement that occurs in study subjects showed an average total PSA level is high (20.53) which means that in 50% of subjects who suffer from metabolic syndrome, have high levels of total PSA. High total PSA in this study may be caused by an increase in prostate volume or because the number of total PSA level at which the subject is taken from community who have high numbers. The results of histopathology is one subject matter that shows a picture of prostate cancer. There is a significant correlation between prostate volume with total PSA levels, but not in a prostate carcinoma.

Although some researchers have found a significant association between benign prostate enlargement and metabolic syndrome including its components, some researchers have contradictory results. Gupta et al reported no significant association between benign prostate enlargement and metabolic syndrome, body weight, body mass index, lipid profile, or thyroid hormone status.[9] Jeong et al reported that metabolic syndrome was not associated with PSA levels in a population with regular screening. Among the risk factors of metabolic syndrome, it appears that blood pressure, upper arm circumference, and fasting blood sugar is directly related to the level of PSA. Until now, the relationship between prostate volume, serum PSA levels and components of the metabolic syndrome have not been able to provide clear boundaries so that there is no an absolute consensus.

CONCLUSION

In this study, we conclude that PV and total PSA levels did not correlate significantly with MS and its components. So that the components of MS can not be used as a reference to assess the growth of the prostate and its management. More extensive research needs to be conducted with a greater number of patients to obtain more valid results that may also be the basis to explain the mechanism of the relationship between the components of MS and BPH.

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