HYPERTENSION IS ASSOCIATED WITH BIGGER PROSTATE VOLUME AMONG BPH PATIENTS AT SOEBANDI GENERAL HOSPITAL, JEMBER

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ABSTRACT

Objective: *Hypertension is one of BPH (Benign Prostate Hyperplasia) risk factors. This study was to compare the prostate volume of hypertensive-BPH patient and normotensive-BPH patient at Soebandi General Hospital Jember.* ***Material & Methods:*** *This is an observational analytic study with cross-sectional design conducted at Soebandi General Hospital, Jember. The data (blood pressure and prostate volume) were obtained from the medical records of BPH patients visiting the Urology Department during December 2021 until January 2022. They were analyzed with Independent T-test.* ***Result:*** *The results showed that there was a significant difference in prostate volume between hypertensive-BPH patients and normotensive BPH patients (p-value: 0.013). Among the BPH patients, the hypertensive groups had a bigger prostate volume than the normotensive groups.* ***Conclusion:*** *This study proves that hypertension is associated with bigger prostate volume among BPH patients at Soebandi General Hospital, Jember.*

Keywords: *Independent T-test, prostate volume, blood pressure.*

ABSTRAK

Tujuan: *Hipertensi merupakan salah satu factor risiko BPH (Benign Prostate Hyperplasia). Penelitian ini bertujuan membandingkan volume prostat pasien Benign Prostate Hyperplasia yang hipertensi dan pasien BPH yang normotensi di RS dr. Soebandi Jember.* ***Bahan & Cara:*** *Penelitian ini adalah observasional analitik dengan desain cross-sectional yang dilakukan di RS dr. Soebandi Jember. Penelitian ini menggunakan data tekanan darah dan volume prostat yang terdapat pada rekam medis pasien BPH yang berkunjung ke poli Urologi selama bulan Desember 2021 sampai Januari 2022. Data tersebut kemudian dianalisis dengan uji t-independent.* ***Hasil:*** *Hasil penelitian menunjukkan bahwa terdapat perbedaan volume prostat yang signifikan antara pasien BPH hipertensi dan pasien BPH normotensif (p-value: 0.013). Pasien BPH yang hipertensi memiliki volume prostat lebih besar daripada pasien BPH yang normotensi.* ***Simpulan:*** *Penelitian ini membuktikan bahwa hipertensi berhubungan dengan peningkatan volume prostat pada pasien BPH di RS dr. Soebandi Jember.*

Kata kunci: *Uji t-independen, volume prostat, tekanan darah.*

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INTRODUCTION

Benign Prostate Hyperplasia (BPH) is defined as a disease characterized by an increase in the number of stromal and epithelial cells in the periurethral area of the prostate which can be seen from the histopathological picture.[1] BPH is a benign tumor that often affects men. Previous research has shown that there are several risk factors for BPH, one of which is hypertension.[2] Hypertension or high blood pressure is a condition when there is an abnormal increase in blood in the structure of the arteries that occurs continuously.[2] Although hypertension and BPH have different mechanisms of disease course, these two diseases are thought to occur due to an increase in the sympathetic nervous system through adrenergic receptors in their pathophysiological mechanism. This increase in sympathetic nerves is predicted to cause an increase in prostate smooth muscle tone, resulting in an increase in the size of the prostate gland.[3]

BPH is characterized by progressive enlargement of the prostate volume in both the fibromuscular and glandular tissue in the

periurethral and transitional zones of the prostate located in the bladder.[4] In medical practice, most prostate disorders are diagnosed by measuring the volume of the prostate. The size of the prostate can be measured using ultrasound.[5]

OBJECTIVE

This study aimed to compare the prostate volume of hypertensive-BPH patient and normotensive-BPH patient at Soebandi General Hospital Jember.

MATERIAL & METHODS

This research was conducted with the type of research method in the form of observational analysis. The research was conducted at Soebandi General Hospital Jember in December 2021-January 2022. The data used in this study were secondary data derived from the medical records of patients diagnosed with BPH at Soebandi General Hospital Jember in 2019-2021.

RESULTS

The data collected were classified according to age, BPH grade based on prostate volume size, and severity of hypertension.

Table 1. Frequency distribution of age in patients with BPH in Soebandi General Hospital Jember 2019-2021.

Age	Frequency of BPH with hypertension	Frequency of BPH without hypertension
≤ 40	0	1
41-50	1	0
51-60	7	2
61-70	11	21
> 70	13	8
Total	32	32

Based on Table 1, it can be seen that the largest group of BPH sufferers is the age range of 61-70 years, namely as many as 32 people. While the group with BPH at least 1 person aged 41-50 years old and 1 person 40 years old. The average age of BPH sufferers with hypertension is 66 years and the most age is 70 years. Meanwhile, the average age of BPH patients without hypertension is 67 years and the most age is 66 years.

Table 2. Frequency of BPH severity based on prostate volume measurement in BPH patients at Soebandi General Hospital Jember in 2019-2021.

BPH Grade	Frequency of BPH with hypertension	Frequency of BPH without hypertension
Grade 1	5	14
Grade 2	19	14
Grade 3	7	4
Grade 4	1	0
Total	32	32

Based on Table 2, it can be seen that the highest BPH grade based on prostate volume size is grade two (31-50 cc) as many as 33 people. While the BPH grade at least based on the size of the prostate volume is grade four (> 80 cc) as many as 1 person. The average size of prostate volume in BPH patients with hypertension is 44 cc and the most is 35 cc. The average size of prostate volume in BPH patients without hypertension is 36 cc and the most is 30 cc.

Table 3. The size of the average prostate volume and the frequency of the severity of hypertension in BPH patients at Soebandi General Hospital Jember 2019-2021.

Grade Hypertension	Mean Prostate Volume Measure (cc)	Frequency
Non Hypertension	36 ± 10	32
Grade 1	41 ± 12	25
Grade 2	56 ± 20	5
Grade 3	54 ± 13	2
Total		64

Based on Table 3, it can be seen that the highest degree of severity of hypertension in BPH patients is first-degree hypertension, which is as many as 25 people (78%). While the degree of severity of hypertension at least is grade three as many as 2 people (6%). From the results of the analysis using the Independent T-test, the significance value of the data is 0.013, which means that there is a significant difference between prostate volume in BPH patients with hypertension and without hypertension.

DISCUSSION

The results of the study are based on the characteristics of the age distribution according to the theory which states that the older you get, the

more likely you are to get BPH. The cause of BPH is related to the aging process so there is a decrease in hormone levels in men, especially testosterone. The hormone testosterone in the prostate gland will be converted into Dihydrotestosterone (DHT) by the alpha-5-reductase isoenzyme so that it stimulates the prostate gland to enlarge.[6]

The results of the study based on the characteristics of the severity of BPH based on the size of the prostate volume were in accordance with previous studies. After puberty, the size of the prostate volume will increase with age in most men's lives.[7] Enlargement of the prostate usually occurs due to hyperplasia caused by a decrease in testosterone levels which are converted to dihydrotestosterone, thereby triggering the proliferation of the prostate gland. In the age range of 30-40 years, microscopic pathological hyperplasia occurs, in the age range of 40-50 years there is macroscopic pathological hyperplasia and over 50 years of age hyperplasia can cause clinical symptoms.[8]

The hypothesis of the role of hypertension in the incidence of BPH is the result of al-adrenoceptor function and increased sympathetic nerve activity so that it will affect the prostate gland and bladder.[9] Hypertension can increase the expression of VEGF (Vascular Endothelial Growth Factor). Increased expression of VEGF will induce angiogenesis resulting in increased clinical symptoms of BPH. In addition, hypertension also causes an increase in catecholamine levels which will affect the growth of the prostate gland by inhibiting the process of apoptosis.[9]

From the results of hypothesis testing using the independent T-test method, it can be concluded that hypertension is a risk factor for BPH by affecting the size of the prostate volume. Hypertension and BPH are diseases whose prevalence increases with aging. Although BPH and hypertension have different pathophysiologies, these two diseases are thought to occur due to an increase in the sympathetic nervous system through-adrenergic receptors.[3]

The limitation of this study is that the research period used is only 3 years, namely 2019-2021 because data before 2019 has been entered into the medical record storage warehouse and cannot be used as a sample. Another limitation is that it still uses secondary data so there may be errors in entering data in the form of numbers considering the medical record data at Soebandi General Hospital Jember still uses handwriting.

CONCLUSION

There is a significant difference between prostate volume in BPH patients with hypertension and without hypertension in Soebandi General Hospital Jember. Size of prostate volume in BPH patients with hypertension in Soebandi General Hospital Jember for the period 2019 to 2021 is 41±12 (degree one); 56 ± 20 (second degree); and 54±13 (third degree). Meanwhile, the size of prostate volume in BPH patients without hypertension at Soebandi General Hospital Jember for the period 2019 to 2021 is 36 ±10.

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