

A DESCRIPTIVE STUDY OF THE PREVALENCE OF LUTS IN PATIENT WITH IPP USING IPPS SCORE

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Abstract

Introduction: One of the most prevalent disorders in older men is benign prostatic hyperplasia (BPH). Histological BPH affects around 40% of men in their 50s and 60s and 90% of men who are over 80 years old, with the frequency rising with age. One of the most significant and unpleasant occurrences in the course of benign prostatic hyperplasia is lower urinary tract symptoms (LUTS) (BPH). **Materials and methods:** This study will include patients who have features of lower urinary tract symptoms with BPH and undergoing prostatectomy during the period of study. Trans-abdominal Ultrasonography will be used to measure Intravesical Prostatic Protrusion and Prostatic Volume at the VMKVMCH in Salem's Department of Radiodiagnosis. IPP was calculated as the shortest distance in the sagittal plane between the protruded end of the prostate and the bladder base, reflecting the prostate's maximum longitudinal length as proposed by Nose et al. **Results:** The distribution of age in the study population ranges from 45 to 85 years. The mean age of study participants were 65 years with a SD of 8.024 years. Half of the study participants were 60-69 years of age group (54%), followed by 70-79 years of age group (26%). The distribution of prostate volume in the study population ranges from 28 to 104 cu cm. The mean prostate volume of study participants were 66 cu cm with a SD of 23.255 cu cm. In our study, 6% of the patients who presented with Acute Urinary retention was found to have only a grade I prostate (<40cc). 42% of the patients had grade II prostate, 34% of the patients grade III prostate and 18% patients grade IV prostate. **Conclusion:** Our study has found a strong correlation between intraprostatic prostatic protrusion and prostate volume as well as a high prevalence of severe intraprostatic protrusion in patients who subsequently suffer acute urinary retention. All of the study participants with significant IPP had an IPSS grade of severe. IPP can be utilized to point the right patients in the direction of more aggressive treatment options like surgery.

Keywords: Benign Prostatic Hyperplasia, Lower Urinary Tract Symptoms, Prostate Volume.

INTRODUCTION

One of the most prevalent disorders in older men is benign prostatic hyperplasia (BPH). Histological BPH affects around 40% of men in their 50s and 60s and 90% of men who are over 80 years old, with the frequency rising with age (1). One of the most significant and unpleasant occurrences in the course of benign prostatic hyperplasia is lower urinary tract symptoms (LUTS) (BPH).¹

Within the next five years, 30% of men in their eighties and 10% of men in their seventies will experience acute urinary retention (AUR). In at least 65% of men who present with AUR, the aetiology is benign prostatic hyperplasia (BPH). Lower urinary tract symptoms (LUTS) were prevalent in men with AUR for an average of 32 months before to the AUR.²

Lower urinary tract symptoms are prevalent in as much as a third of BPH surgery patients. Lower urinary tract symptoms are quite stressful, uncomfortable, and inconvenient for the patient. However, the size of the prostate does not totally determine the signs and blockage. Contrarily, it has been discovered that Intravesical Prostatic Protrusion (IPP) and Bladder Outlet Obstruction are related.³ Intravesical Prostatic Protrusion (IPP) is a morphological alteration brought on by the prostatic median and lateral lobes' excessive development into the bladder. IPP can cause the bladder to move erratically when urinating. Previous research has shown that the ultrasonographic assessment of IPP can swiftly and noninvasively identify Bladder Outlet Obstruction (BOO) in BPH patients. In patients with LUTS, detection of significant IPP can be an indication for early surgical intervention.⁴

In order to determine the prevalence of intraprostatic protrusion and the relationship between it and prostate volume in patients who have acute urinary retention caused by BPH, we are conducting a hospital-based investigation in this study.⁵

Aims and Objectives

To study the prevalence of LUTS in patient with IPP using IPPS score

To study the correlation between Intravesical Prostatic Protrusion and Prostatic Volume.

MATERIALS AND METHODS

Study Period: JULY 2020 – JUNE 2022

Study Population N = 50

Patients who are admitted, diagnosed as LUTS due to BPH

Sample Size N=50

All patients diagnosed, Admitted for BPH (50) patients

Type Of Study: Descriptive study

Inclusion Criteria:

- All patients of BPH presenting with LOWER URINARY TRACT SYMPTOMS
- Men of age group 45-85 years

Exclusion Criteria:

- Urethral stricture, urethral rupture, pin hole meatus, phimosis & paraphimosis
- CA rectum
- Neurological conditions (Parkinson's disease or CVA which predispose the patient to neurogenic bladder)
- Documented malignancy
- Paediatric age group

Method:

This study will include patients who have features of lower urinary tract symptoms with BPH and undergoing prostatectomy during the period of study.

Measurements:

Trans-abdominal Ultrasonography will be used to measure Intravesical Prostatic Protrusion and Prostatic Volume at the VMKVMCH in Salem's Department of Radiodiagnosis. IPP was calculated as the shortest distance in the sagittal plane between the protruded end of the prostate and the bladder base, reflecting the prostate's maximum longitudinal length as proposed by Nose et al.



Figure 1: Prostate Volume Measurement



Figure 2: IPP is measured on a sagittal view by measuring the distance from the bladder base to the greatest protrusion of the prostate into the bladder perpendicularly

- IPP < 10mm is not considered significant.
- IPP > 10mm is considered significant
- Normal Prostate Volume: 15 – 20 cc.

Correlation of the IPP with volume of the prostate and the prevalence of significant IPP in patients presenting with Acute Retention of Urine was calculated.

RESULTS

Age Distribution

The distribution of age in the study population ranges from 45 to 85 years. The mean age of study participants were 65 years with a SD of 8.024 years.

Table 1: Distribution of age of participants

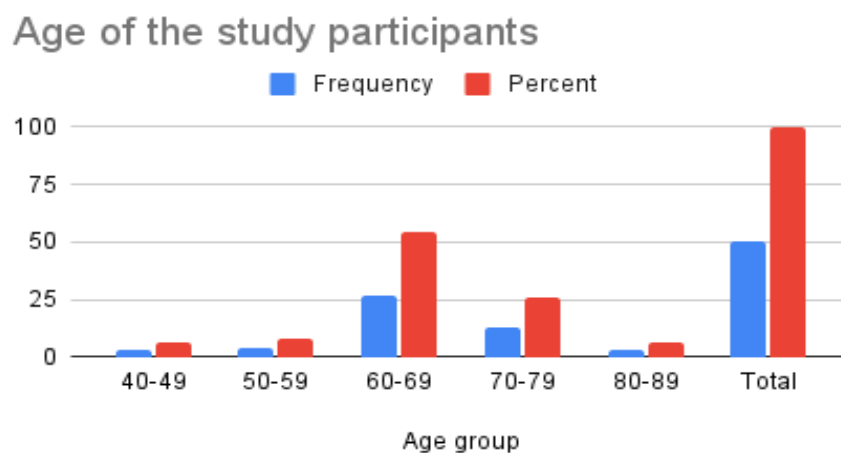
S. No	Age characteristics	Value
1	Minimum	46
2	Maximum	80
3	Mean	65
4	Standard deviation	8.024859

Half of the study participants were 60-69 years of age group (54%), followed by 70-79 years of age group (26%).

Table 2: Age distribution in the study population

Age group	Frequency	Percent
40-49	3	6
50-59	4	8
60-69	27	54
70-79	13	26
80-89	3	6
Total	50	100

Graph 1: Age of the study participants



Prostate Volume

The distribution of prostate volume in the study population ranges from 28 to 104 cu cm. The mean prostate volume of study participants were 66 cu cm with a SD of 23.255 cu cm.

Table 3: Distribution of prostate volume

Prostate volume	Value (cu cm)
Minimum	28
Maximum	104
Mean	66
Standard deviation	23.255

Intravesical Prostatic Protrusion (IPP)

The distribution of intravesical prostatic protrusion (IPP) in the study population ranges from 4 to 24 mm. The mean IPP of study participants were 14 mm with a SD of 5.412 mm.

Table 4: Distribution of IPP

IPP	Value
Minimum	4
Maximum	24
Mean	14
Standard deviation	14.14213562

PREVALENCE OF SIGNIFICANT INTRAVESICAL PROSTATIC PROTRUSION (IPP)

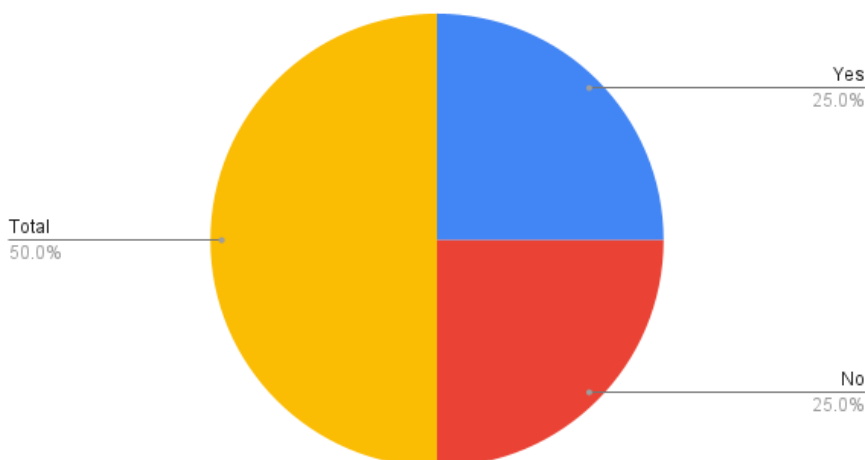
Table 5: Distribution of prevalence of significant IPP

Significant IPP (>10mm)	Frequency	Percent
Yes	25	50
No	25	50
Total	50	100

In our study, significant Intravesical Prostatic Protrusion was present in 50% of patients who presented with Acute Urinary Retention.

Graph 2: Prevalence of significant intravesical prostatic protrusion (IPP)

Prevalence of significant intravesical prostatic protrusion (IPP)



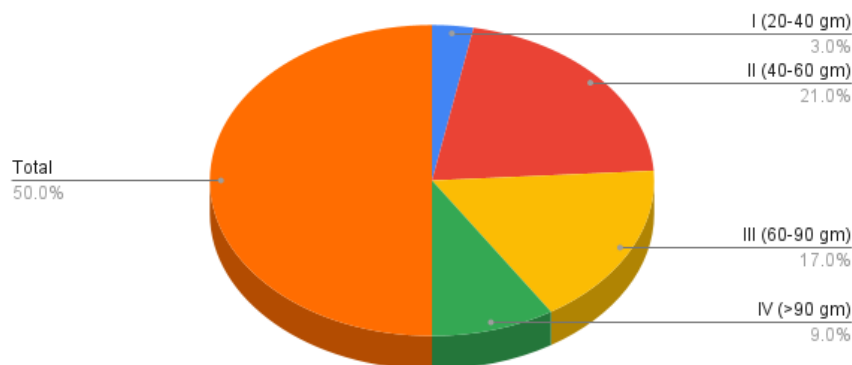
Prostate Grade

35.3% of the study participants have grade III prostatomegaly (60-90 gm) and 30.9% of the study participants have grade II prostatomegaly (40-60 gm).

Table 7: Distribution of prostate grade

Prostate grade	Frequency	Percent
I (20-40 gm)	3	6
II (40-60 gm)	21	42
III (60-90 gm)	17	34
IV (>90 gm)	9	18
Total	50	100

Prostate grade in the study population



Graph 3: Distribution of prostate grade

In our study, 6% of the patients who presented with Acute Urinary retention was found to have only a grade I prostate (<40cc). 42% of the patients had grade II prostate, 34% of the patients grade III prostate and 18% patients grade IV prostate.

Table 8: Distribution of Prostate grade among patients with significant IPP

Prostate grade	Significant IPP			
	>10mm		≤10mm	
	Freq.	%	Freq.	%
I	3	6	0	0
II	14	28	10	20
III	4	8	10	20
IV	10	20	9	18

IPSS Components

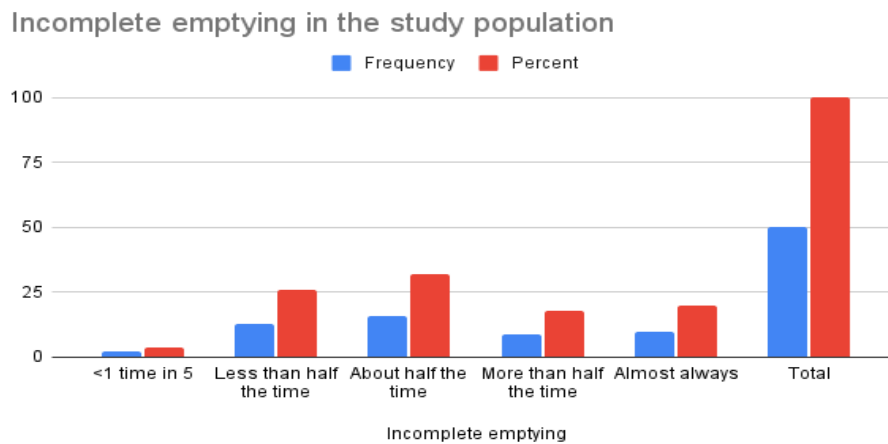
Incomplete Emptying

Table 9: Distribution of incomplete emptying

Incomplete emptying	Frequency	Percent
<1 time in 5	2	4
Less than half the time	13	26
About half the time	16	32
More than half the time	9	18
Almost always	10	20
Total	50	100

In our study, about 32% of patient gave a history of incomplete micturition less than half the time, and 18% had the complaint almost always.

Graph 4: Incomplete emptying in the study population

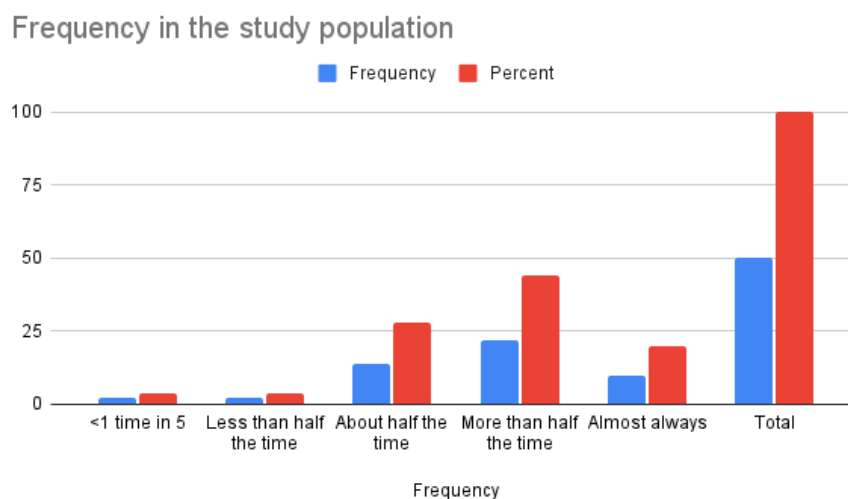


Frequency

Table 10: Distribution of frequency

Frequency	Frequency	Percent
<1 time in 5	2	4
Less than half the time	2	4
About half the time	14	28
More than half the time	22	44
Almost always	10	20
Total	50	100

Graph 5: Frequency in the study population

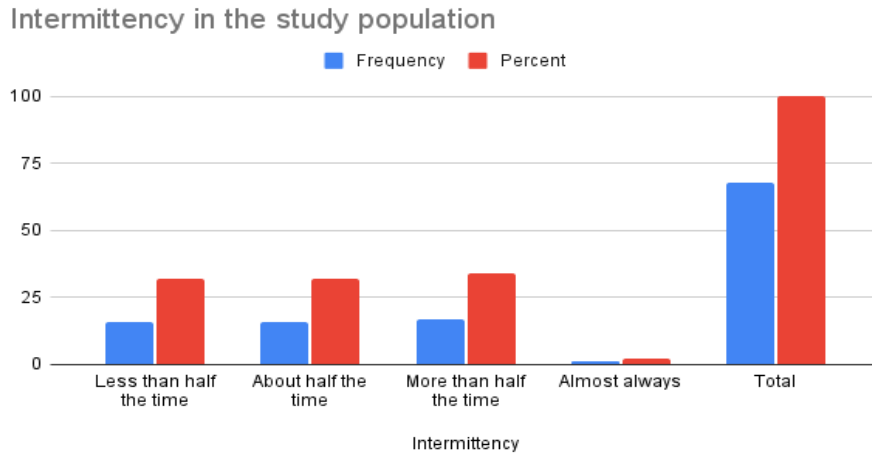


Intermittency

Table 11: Distribution of intermittency

Intermittency	Frequency	Percent
Less than half the time	16	32
About half the time	16	32
More than half the time	17	34
Almost always	1	2
Total	50	100

Graph 6: Intermittency in the study population



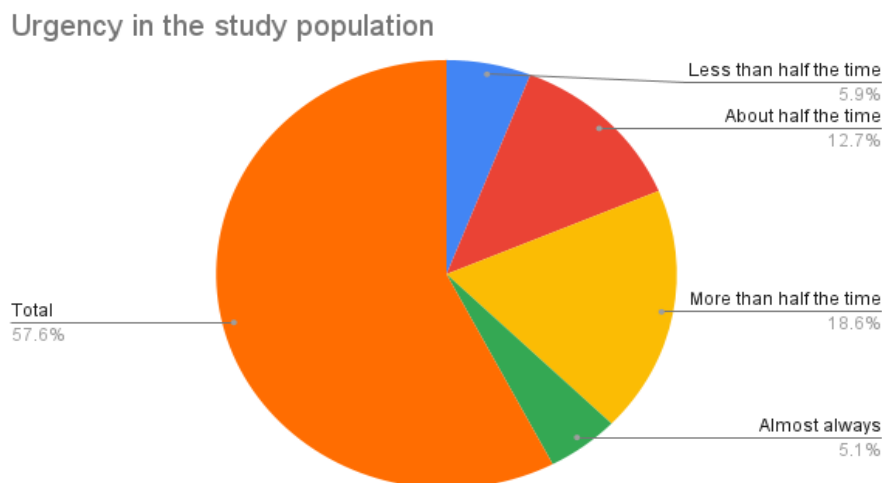
In our study, about 16% of the patients had intermittency while voiding about half the time while 17% of the patient had the complaint more than half the time.

Urgency

Table 12: Distribution of urgency

Urgency	Frequency	Percent
Less than half the time	7	14
About half the time	15	30
More than half the time	22	44
Almost always	6	12
Total	50	100

Graph 7: Urgency in the study population



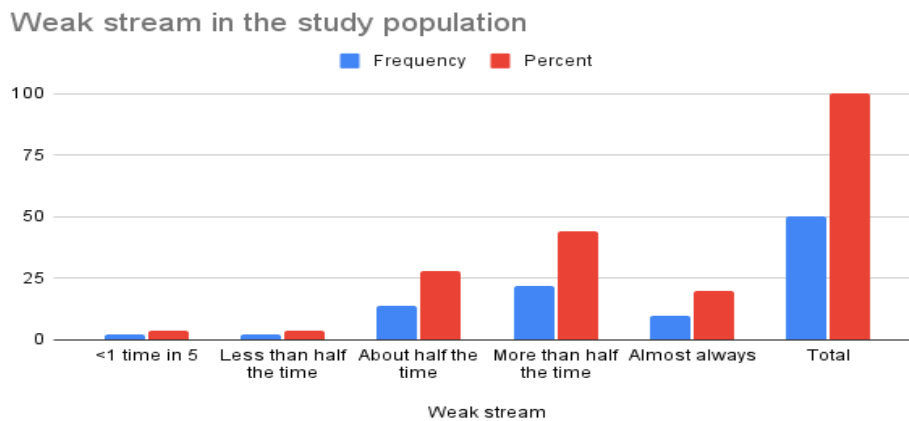
In our study about 15% of the patients complained of weak urinary stream more than half the time and about 22% had the complaint about half the time.

Weak Stream

Table 13: Distribution of weak stream

Weak stream	Frequency	Percent
Less than half the time	1	14
About half the time	19	30
More than half the time	19	44
Almost always	11	12
Total	50	100

Graph 8: Weak stream in the study population



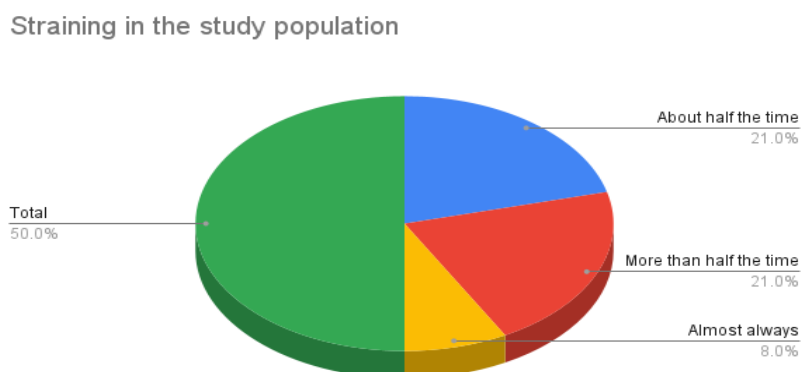
About 11% had a weak stream of urine almost always and the rest of the patients had the complaint atleast half the time

Straining

Table 14: Distribution of straining

Straining	Frequency	Percent
About half the time	21	42
More than half the time	21	42
Almost always	8	16
Total	50	100

Graph 9: Straining in the study population



About 21% of the patients in our study had to strain to void urine equal to half the time and 21% had the complaint about half the time.

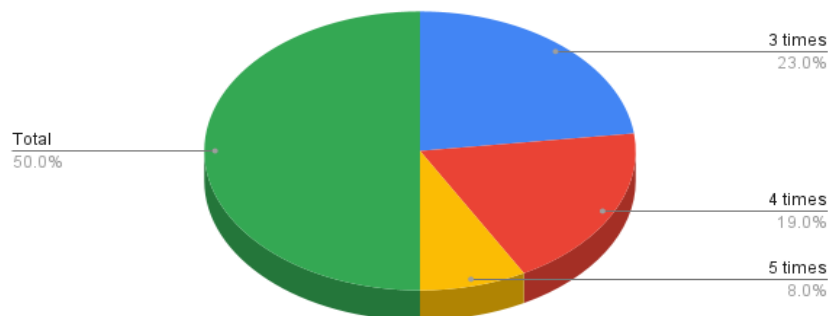
Nocturia

Table 15: Distribution of nocturia

Nocturia	Frequency	Percent
3 times	23	46
4 times	19	38
5 times	8	16
Total	50	100

Graph 10: Nocturia in the study population

Nocturia in the study population



Quality Of Life

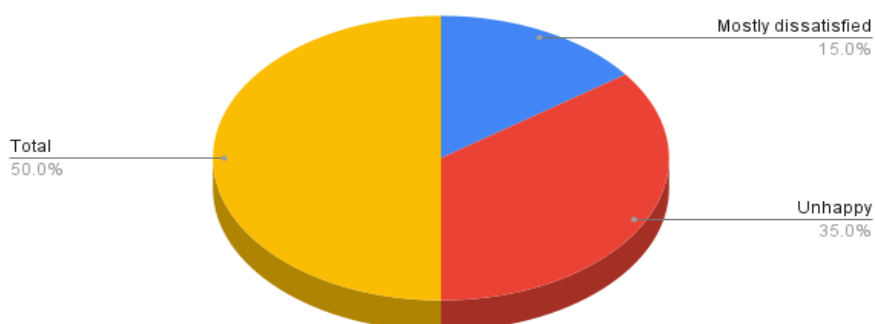
More than half of the study participants are unhappy (70%).

Table 16: Distribution of quality of life

Quality of life	Frequency	Percent
Mostly dissatisfied	15	30
Unhappy	35	70
Total	50	100

Graph 11: Quality of life in the study population

Frequency and Percent



IPSS

The distribution of IPSS in the study population ranges from 17 to 34. The mean IPSS of study participants were 25.5 with a SD 4.692.

Table 7: Distribution of IPSS

IPSS	Value
Minimum	17
Maximum	34
Mean	25.5
Standard deviation	4.692

IPSS Grade

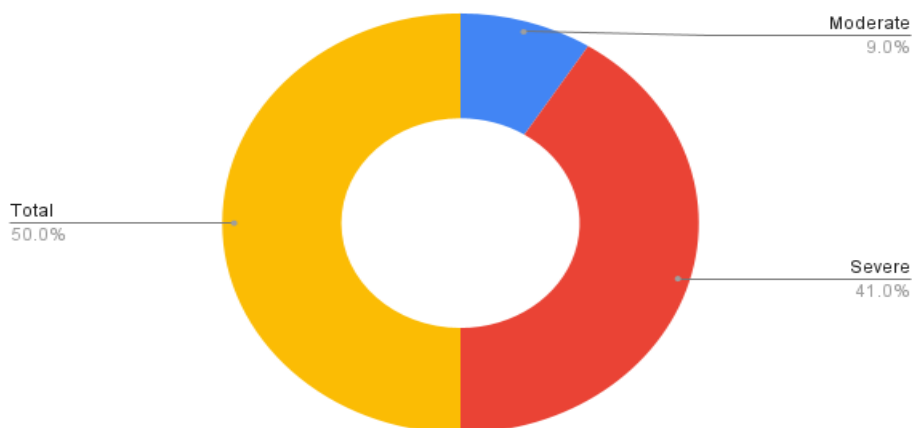
All individuals who experienced acute urinary retention had IPSS grades that were at least moderate. The IPSS grade for 82% of the study's participants is severe.

Table 8: Distribution of IPSS grade

IPSS grade	Frequency	Percent
Moderate	9	18
Severe	41	82
Total	50	100

Graph 12: IPSS grade in the study population

IPSS grade in the study population



Previous AUR

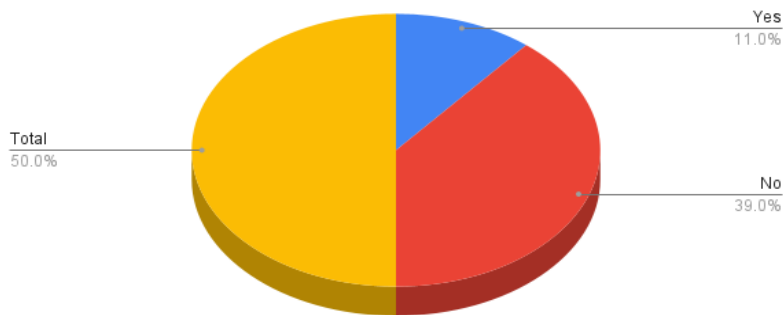
22% of the study population have had a previous AUR.

Table 9: Distribution of previous AUR

Previous AUR	Frequency	Percent
Yes	11	22
No	39	78
Total	50	100

Graph 13: Previous AUR in the study population

Previous AUR in the study population



PUS Cells in Urine Routine Examination

A regular urine test revealed pus cells in urine from 52% of the research participants.

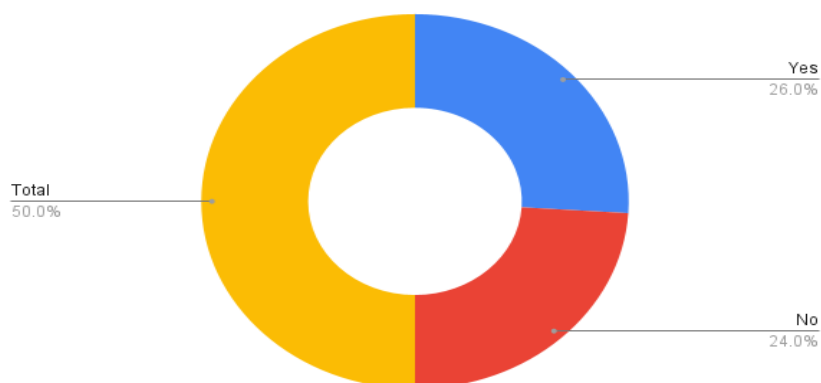
Table 10: Distribution of pus cells in urine routine examination

Pus cells in urine routine examination	Frequency	Percent
Yes	26	52
No	24	48
Total	50	100

Pus cells in urine routine examination

Graph 14: Distribution of pus cells in urine routine examination

Pus cells in urine routine examination



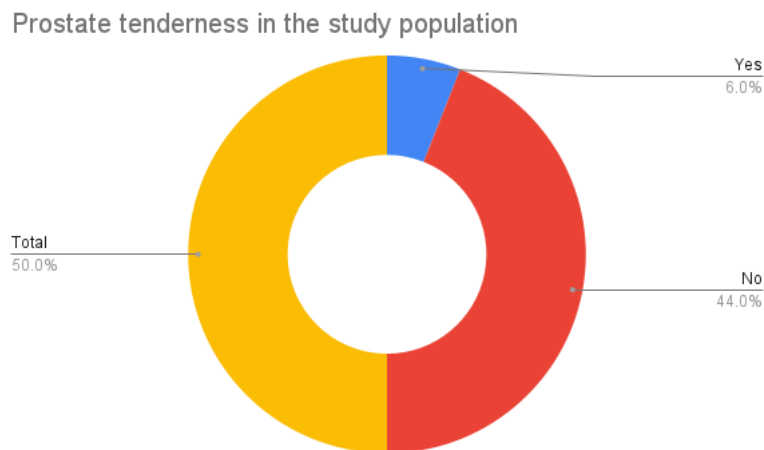
Prostate Tenderness

Only 10.3% (7) have prostate tenderness.

Table 11: Distribution of prostate tenderness

Prostate tenderness	Frequency	Percent
Yes	6	12
No	44	88
Total	50	100

Graph 15: Prostate tenderness in the study population



Correlation between Intravesical Prostatic Protrusion and Prostatic Volume

There is strong positive correlation (0.878) between intravesical prostatic protrusion and prostatic volume

Table 12: Correlation between intravesical prostatic protrusion and prostatic volume

		Prostatic volume	IPP
Prostatic volume	Pearson Correlation	1	0.878**
	Sig. (2-tailed)		0.000
	N	68	68
IPP	Pearson Correlation	0.878**	1
	Sig. (2-tailed)	0.000	
	N	68	68

DISCUSSION

Although benign prostatic hyperplasia is not a life-threatening disease, it has a negative impact on one's quality of life. Most patients seek treatment to be relieved of bothersome symptoms. Benign Prostatic Hyperplasia is a common cause of Bladder Outlet Obstruction, which leads to Acute Urinary Retention in the long run. The consequences of acute urinary retention on patients' health the quality of life is comparable to a renal colic attack.⁶ Urodynamic studies are the gold standard for determining Bladder outlet obstruction. However, because it is an invasive, time-consuming, and costly procedure, its clinical applications have been limited. Several non-invasive indices have been attempted to obtain comparable information in order to target more aggressive therapy to those patients who are most likely to benefit.⁷

In our research, we discovered a strong correlation between IPP and prostate volume. A higher grade IPP is also probably present with a larger prostate volume. Additionally, every patient in our study with significant IPP received a grade of severe on the IPSS. The value of evaluating IPP is particularly obvious in tiny prostate glands with blockage, despite the fact that our study shows a high association between Prostate Volume and Intravesical Prostatic Protrusion. These glands typically have a high IPP. A projecting median lobe causes a ball-valve effect while voiding, which contributes to the high IPP. Although a strong bladder contraction force could create a channel

between the lobes, IPP suffers as a result because it exacerbates the ball valve effect, which raises urethral resistance.⁸

IPP measurement can easily be obtained from a transabdominal USG in an outpatient setting and is a non-invasive, reproducible and a cost-effective procedure.⁹

All patients in our study with significant IPP had a severe IPSS grade. Previous studies (Cumpanas et al. and Mariappan et al.) have shown that trial voiding without catheter is likely to fail in these patients. Hence greater emphasis is warranted in the evaluation of BPH during decision making in offering treatment options.¹⁰

CONCLUSION

Our study has found a strong correlation between intraprostatic prostatic protrusion and prostate volume as well as a high prevalence of severe intraprostatic protrusion in patients who subsequently suffer acute urinary retention. All of the study participants with significant IPP had an IPSS grade of severe. IPP can be utilized to point the right patients in the direction of more aggressive treatment options like surgery.

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