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**ORIGINAL RESEARCH** 

# Correlation between the presence of Inguinal hernias and Lower urinary tract symptoms associated with BPH

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#### Abstract

**Background:** Inguinal hernias are the most common kind of hernia in the abdominal wall, and they may be caused by a number of different underlying conditions. Male pattern baldness (BPH) is the most prevalent cause of bladder outlet obstruction in elderly men, leading to prolonged straining and difficulty micturition that may proceed to inguinal hernia. Age increases the likelihood of developing both inguinal hernias and BPH with lower urinary tract symptoms. Some studies suggest that their coincidence rather than cause and effect may explain their co-occurrence. The aim of this study to evaluate the correlation between the presence of Inguinal hernias and Lower urinary tract symptoms associated with BPH.

**Materials and Methods:** A total of 120 participants participated in this trial. The institution's ethics committee approved the project. Subjects were divided into two categories: those with inguinal hernias (group 1)(cases) and those without (group 2) (controls). According to predetermined criteria, the first 60 male patients were selected. we were able to quantify the prevalence of BPH in cases and controls according to each variable independently.

**Results:** In this study, the cases were all males, aged between 39 years and 74 years with a mean age of 55.52 years. The controls were aged between 38 years and 72 years with a mean age of 57.48 years. Group 1 had an average IPSS of 6.65, whereas Group 2 averaged 6.75. In Group 1, the average volume of the prostate was 23.01 cc, whereas in Group 2, it was 23.15 cc. 35% of Group 1 and 31.67 percent of Group 2 had prostate volumes greater than 25 cc, the threshold for diagnosis of prostatomegaly based on transabdominal ultrasound measurements (Table 4). However, there was no statistically significant difference. Patients with moderate and severe symptoms, as determined by the IPSS, underwent uroflowmetric analysis. The most robust indicator of BPH was Q Max, hence it was used as the cutoff. P = 0.44 indicates no significant difference between Group 1 and Group 2 in terms of mean Q max, which was 14.98 ml/sec and 14.82 ml/sec, respectively. Q max values of less than 15 ml/sec were considered to be statistically significant, and 16.67% of cases and 13.33% of controls fell into this category.

**Conclusion:** The results indicate that there is no correlation between inguinal hernia and BPH. It's only two of the many illnesses that are increasing in prevalence among the elderly. Though there is no statistical evidence connecting inguinal hernia with BPH, the presence of either ailment has a profound effect on the patient's quality of life and must be addressed in any treatment plan.

Keywords: BPH, Inguinal hernia, IPSS, Prostate volume, Peak flow rate

### Introduction

The incidence of lower urinary tract symptoms (LUTS) increases with age in males. The onset of urinary symptoms may be caused by a number of different circumstances. Aging-

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related alterations in the neurological system and bladder, metabolic shifts, altered fluid control, blockage, and autonomic overactivity also belong to this category. <sup>1</sup> Mechanical blockage of the urinary system or bladder hypocontractility are two potential causes of LUTS. These pathophysiologic components often occur together in the elderly, although they may also occur alone. <sup>2</sup> Moderate to severe LUTS affects between 16.2% and 25.1% of men, whereas 72.3% and 47.9% of men report experiencing LUTS at least "often" or "frequently," respectively. As a population ages, the incidence of LUTS increases, and the quality of life for individuals who suffer from it declines dramatically. <sup>3</sup>

When it comes to general surgery, 15% to 18% of all cases need repairs to the abdominal wall.<sup>4</sup> Seventy-five percent of all hernias in the abdominal wall are caused by an inguinal hernia. Inguinal hernias are more frequent in males, who have a 27% chance of having one over the course of their lives. <sup>2</sup> There is no one etiological risk factor for hernia. Inguinal hernias develop when the pressure within the abdomen rises, and the symptoms most often associated with this include coughing, constipation, micturition problems, pregnancy, smoking, ascites, and heavy lifting. Inguinal hernias may be inherited or occur at birth due to conditions like patent processus vaginalis or connective tissue illnesses or collagen abnormalities. <sup>5</sup>

Lower urinary tract symptoms (LUTS) and bladder outlet obstruction (BOO) are frequent in elderly men, with BPH being a leading cause of both. This may lead to increased straining and difficulty micturating.<sup>6</sup> BPH-related lower urinary tract symptoms are evaluated using a variety of symptom severity categories. The International Prostate Symptom Score (IPSS) is the most used tool, and it classifies symptoms as either mild (score: 0-7), moderate (score: 8-19), or severe (20+). (score: 20-35). <sup>6,7</sup> Lower urinary tract discomfort from benign prostatic hyperplasia and inguinal hernias both increase with age. It would seem that inguinal hernia patients have greater IPSSs than individuals who do not have this condition. Combinations of inguinal hernia with symptomatic benign prostatic hyperplasia are common among the elderly. Therefore, it's plausible that inguinal hernia and BPH are linked in a significant way. Some research has shown that their presence is seen as a coincidence rather than a result of another factor. <sup>8</sup>The aim of this study to evaluate the correlation between the presence of Inguinal hernias and Lower urinary tract symptoms associated with BPH.

#### **Materials and Methods**

A total of 120 participants participated in this trial. The institution's ethics committee approved the project. Subjects were divided into two categories: those with inguinal hernias (group 1)(cases) and those without (group 2) (controls). According to predetermined criteria, the first 60 male patients were selected. No consideration was given to whether the hernias were unilateral, bilateral, or recurrent while selecting the patients. Everyone man above the age of 35 was included in this study. Patients were not included in the study if they were taking any drugs, had prior BPH surgery, had a history of voiding dysfunction therapy, or had irreducible, strangulating, or blocking hernias. Both the patients and controls gave their express, written consent. All subjects were evaluated and interrogated by a single researcher. The following three parameters were assessed for both cases and controls.

- 1. International Prostate Symptom Score (IPSS)
- 2. Prostate volume (PV)
- 3. Uroflowmetric analysis peak flow rate (PFR or Q max)

With these data, we were able to quantify the prevalence of BPH in cases and controls according to each variable independently.

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### **Statistical analysis**

Statistical analysis was performed using SPSS 25.0. Between the two groups, a univariate analysis was performed on each parameter. The p value was determined after running the Chi-square test and the Unpaired T test. Statistical significance was assumed at the 0.05 level.

### Results

In this study, the cases were all males, aged between 39 years and 74 years with a mean age of 55.52 years. The controls were aged between 38 years and 72 years with a mean age of 57.48 years.

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Age in years	Group 1	%	Group 2	%
35-45	18	30	19	31.67
45-55	20	33.33	21	35
55-65	18	30	16	26.67
above 65	4	6.67	4	6.67
Mean Age	55.52		57.48	

 Table 1 Age distribution in group 1 and group 2

The average ages of participants in each group were not significantly different from one another. In both the case and control groups, the median age was 45 years old. (table1). Of these patients, 35% had direct hernias, 60% had indirect hernias, and 5% had recurrent hernias. Patients in the control group suffered from a wide range of conditions, including hydrocele, cellulitis, gall stone disorders, haemorrhoids, fissure in ano, acid peptic disease/gastritis, skin swellings, pancreatitis, and varicose veins.

Group 1 had an average IPSS of 6.65, whereas Group 2 averaged 6.75. (Table 2). In Group 1, the average volume of the prostate was 23.01 cc, whereas in Group 2, it was 23.15 cc.

 Table 2: Mean values of different parameters among group 1 and group 2

Parameters	Mean values		P value
	Group 1	Group 2	
IPSS score	6.65	6.75	0.22
Prostate volume (cc)	23.01	23.15	0.32
Peak flow rate (Qmax) (ml/sec)	15.11	15.65	0.19

Twenty percent of the cases in this research had no symptoms, fifty percent had mild symptoms, twenty-five percent had moderate symptoms, and five percent had severe symptoms at admission. Sixteen percent of the controls had no symptoms, 53.33 percent showed very mild symptoms, 20 percent showed moderate symptoms, and 10 percent showed severe symptoms (table 3). There was no discernible difference between the two groups statistically.

Table 3 Prostate volume in group 1 and group 2

	Group 1	Percentage	Group 2	Percentage
Asypmtomatic	12	20	10	16.67
Mildly symptomatic	30	50	32	53.33
Moderately symptomatic	15	25	12	20
Severely symptomatic	3	5	6	10

35% of Group 1 and 31.67 percent of Group 2 had prostate volumes greater than 25 cc, the threshold for diagnosis of prostatomegaly based on transabdominal ultrasound measurements (Table 4). However, there was no statistically significant difference.

 Table 4: BPH based on prostate volume in group 1 and group 2

Group	Prostate volume		Chi square	P value
	<25 cc	≥25 cc		
Group 1	39	21		

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Group 2	41	19	0.17	0.55

Patients with moderate and severe symptoms, as determined by the IPSS, underwent uroflowmetric analysis. The most robust indicator of BPH was Q Max, hence it was used as the cutoff. P = 0.44 indicates no significant difference between Group 1 and Group 2 in terms of mean Q max, which was 14.98 ml/sec and 14.82 ml/sec, respectively (Table 1). Q max values of less than 15 ml/sec were considered to be statistically significant, and 16.67% of cases and 13.33% of controls fell into this category (Table 5).

Group	Q Max		Chi square	P value
	<15 ml/sec	≥15 ml/sec		
Group 1	10	8	0.62	0.44
Group 2	8	10		

	Table 5: Q m	ax values among	group 1 and group	) 2
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### Discussion

IPSS mean scores were 6.65 for Group 1 and 6.75 for Group 2. The statistical significance of the difference was quite low. There was no statistically significant difference in symptom severity between the two groups. Primary care physicians who lack access to urological diagnostics may use IPSS scores and patient severity classifications to guide initial treatment, as reported by Liao et al. <sup>9</sup> Patients with inguinal hernias showed higher IPSS scores compared to those without the condition, as reported by Reis et al. Our study found that the inguinal hernia group's IPSS was lower than that of the control group. This is not supported by any research in the literature.

Both Group 1 and Group 2 had mean prostate volumes of 23.01 cc, with Group 2 having a slightly larger amount of 23.15 cc. Taking statistical significance into account, there is no discernible difference. Prostate morphological research conducted by Kayalvizhi et al. found a similar range of prostate volume (16.8-26.6 cc), which is compatible with the present study. <sup>10</sup> Berges et al. discovered that in men aged 50 and above, the average volume of the prostate was 30.5 cc. <sup>11</sup>

The Baltimore study of longevity found that the average volume of the prostate was 28.1 cc.<sup>12</sup> Previous studies may have shown greater values because they focused on participants older than 50, while our study included participants as young as 35. There was no statistically significant difference between the two groups with regards to the presence of a prostatic volume more than 25 cc; 35% of Group 1 and 31.67% of Group 2 fell into this category. There is a 41% frequency of prostatomegaly in men older than 50, as reported by Mor et al.<sup>13</sup> The prostate expands at a rate of 2.2% each year, as reported by Bosch et al. In yet another population study, Rhodes et al. reported that prostate volumes increase by 1.6% year.<sup>14</sup> Our study's lower incidence can be attributed to the fact that it included patients as young as 35 years old, whereas similar studies that only included people over 50 years old tended to have larger sample sizes because older men's prostates had already grown larger over the course of their lifetimes.

Patients with moderate to severe symptoms (as determined by the IPSS) had a mean Q max of 14.98 ml/sec in Group 1 and 14.82 ml/sec in Group 2, respectively. In order to properly diagnose BPH, tests measuring urine flow are crucial. Q max, or peak flow rate, is more specific than FEV1 in identifying people with BPH. It is more probable that a man with LUTS and a normal Q max would have symptoms unrelated to BPH. Consistent with our results, Senturk et al. observed that the mean Q max in patients with LUTS and inguinal hernia was 13.78 ml/sec.<sup>15</sup> Our results are congruent with those of Sundaram et al., who calculated a mean Q max of 14 ml/sec. Twenty-one percent of cases and seventeen percent of controls had a Q max value of 15 ml/sec when the cut-off value was 15 ml/sec.<sup>16</sup>

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Patients with Inguinal hernia had higher mean Q max values and a greater percentage of patients with Q max 15 ml/sec than patients without hernia, although the difference between cases and controls was not statistically significant. Q max is the best parameter for analysing the obstructive nature of BPH; therefore, it is plausible that patients with obstructive voiding dysfunction due to BPH may need to strain for voiding, and that this effort, over time, may have a direct impact on the abdominal wall, contributing to the development of IH. The ageing process itself, which results in many functional and anatomic problems, may also contribute to the onset of Inguinal Hernia and BPH.

After surgery, urinary retention is a frequent issue that may affect patients of many different professions. This usually calls for a urethral catheterization, which carries with it the risk of urethral injury and infections associated to the catheter as well as higher overall hospital costs. Sivasankaran et al. found that 41% of patients with post-operative urine retention after Laparascopic hernia repair had BPH. <sup>17</sup> Another study by Patel et al found that BPH was the cause of urinary retention in 14% of men who underwent inguinal hernia surgery. <sup>18</sup>

Multiple recent studies have highlighted the benefits of doing both inguinal hernia and prostate surgeries in a single, convenient outpatient visit. More satisfied patients, shorter hospital stays, quicker recoveries, and reduced overall hospital costs are just some of the advantages of combining these two treatments into a single session.<sup>19</sup> Some studies have shown an increased risk of wound infection after this kind of combined operation. This, however, has drastically diminished with the advent of TURP (trans-urethral resection of the prostate).<sup>20</sup> Based on their findings, Khiari et al. concluded that the rates of inguinal wound infection after inguinal hernia surgery plus open suprapubic prostatectomy or TURP were 5% and 4%, respectively. Results from combined inguinal hernia repair and prostatic disease surgery were shown to be better than those from hernia repair or prostatectomy done separately.<sup>21</sup> No postoperative wound or mesh infection was seen in the Bawa et al. experiment of combined TURP and mesh hernioplasty, and there was no appreciable increase in operating time (55 minutes). 13 Oathman et al., in a separate study, discovered that there were no infections in either the wounds or the meshes after the combined surgery.<sup>20</sup>

### Conclusion

In none of the examined metrics was there a discernible difference between the two groups. The results indicate that there is no correlation between inguinal hernia and BPH. It's only two of the many illnesses that are increasing in prevalence among the elderly. Though there is no statistical evidence connecting inguinal hernia with BPH, the presence of either ailment has a profound effect on the patient's quality of life and must be addressed in any treatment plan. Therefore, it is recommended that treatment for both illnesses be carried out simultaneously. In addition, the International Prostate Symptom Score (IPSS) should be made available to all patients hospitalised with an inguinal hernia for the early diagnosis of lower urinary tract symptoms associated with BPH.

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