

Original Research Article

A study on association between inguinal hernia and benign prostatic hyperplasia

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ABSTRACT

Background: Inguinal hernia is the most common cause of abdomen wall hernias with multiple etiological risk factors. Benign prostatic hyperplasia (BPH) is the most important cause of bladder outlet obstruction in elderly males leading to chronic straining and difficulty in micturition, which can precipitate inguinal hernia. The occurrence of both inguinal hernia and BPH with lower urinary tract symptoms increases with age. Some studies show that their occurrence together is considered a chance co-existence rather than cause and effect. This study is aimed to find out whether BPH is a significant risk factor for developing inguinal hernia in males.

Methods: This study was conducted at a tertiary care hospital in Chennai. 126 males, aged 40 and above were selected according to inclusion criteria and were divided into two groups viz cases (with inguinal hernia) and controls (without inguinal hernia). IPSS scoring chart, prostate volume and uroflometric analysis were done for both groups and results were compared.

Results: IPSS scoring showed 22 cases (35%) and 22 controls (35%) had moderate to severe symptoms and no statistical significance. The mean prostate volume in cases was 22.5 g compared with 22.6 g among controls and was statistically insignificant. 11 cases (17%) and 13 controls (21%) had Qmax value less than 15 and the difference was statistically insignificant.

Conclusions: This study shows that, although both inguinal hernia and benign prostatic hyperplasia are seen with increased frequency in the aged male population, there is no statistically significant association between the two. Their occurrence together is considered a chance co-existence rather than cause and effect.

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

INTRODUCTION

Abdominal wall hernias are the most commonly encountered cases in general surgical practice accounting for approximately 15%-18% of all surgical procedures.¹ Inguinal hernia is the most common cause of abdomen wall hernias contributing to 75% of all abdomen hernias. They are present more commonly in males who bear a lifetime risk of 27% for developing inguinal hernia.² Multiple etiological risk factors are associated with hernia. The most common factors that are known to cause

inguinal hernia are chronic cough, constipation, difficulty micturition, pregnancy, smoking, ascites, and heavy lifting, due to increase in intra-abdominal pressure. Patent processus vaginalis, Connective tissue disorders, collagen disorders, and a history of inguinal hernia in the family are considered as congenital causes.²

Benign prostatic hyperplasia is one of the important causes of lower urinary tract symptoms (LUTS) and bladder outlet obstruction (BOO) in elderly males leading to chronic straining and difficulty in micturition.³ Many

symptom severity scores are being used in the evaluation of lower urinary tract symptoms that occur due to BPH. The most frequently used is the International Prostate Symptom Score (IPSS) by which the symptoms are classified as mild (score: 0-7), moderate (score: 8-19), or severe (score: 20-35).^{3,4} The occurrence of both inguinal hernia and benign prostatic hyperplasia with lower urinary tract symptoms increases with age. Patients with an inguinal hernia reportedly have higher IPSSs than those without inguinal hernia.

Both inguinal hernia and symptomatic benign prostatic hyperplasia are often found together in increased frequency in elderly. Hence a significant association between inguinal hernia and benign prostatic hyperplasia may be expected. But some of the studies showed that their occurrence together is considered as just a co-existence rather than cause and effect.⁵ This study is aimed to find out whether benign prostatic hyperplasia is a significant risk factor for developing inguinal hernia in males.

METHODS

A cross sectional study was undertaken in the Department of General Surgery, SRM Medical College Hospital & Research Centre, Kanchipuram District of Tamil Nadu for a period of 17 months from May 2017 to September 2018 on 126 patients. Approval from SRM Institutional Scientific and Ethical committee was obtained to conduct the study. The study population was divided into two groups— patients with inguinal hernia (cases) and patients without inguinal hernia (controls).

Selection of cases

The method of selection was to select the first 63 male patients as per the inclusion and exclusion criteria in the order of the date of their admission admitted in general surgery ward within the study period, without any other methods of randomization. The case selection was independent of the side of the hernia or whether the hernia is unilateral, bilateral or recurrent.

Inclusion criteria for cases

- Male sex
- Age more than or equal to 40 years

Exclusion criteria for cases

- Patients who are already on drugs or have had any form of surgery for BPH in the past.
- Presence of complications of hernia such as irreducibility, strangulation or obstruction.
- Urethral stricture
- Prostate carcinoma
- Previous therapy for voiding Dysfunction

Selection of controls

After selection of cases, the next male patient diagnosed with diseases other than inguinal or any abdominal wall hernia, fulfilling the inclusion criteria are selected as controls

Inclusion criteria for controls

- Male sex
- Age more than or equal to 40 years
- Not seriously ill.

Exclusion criteria for controls

- Patients who are already on drugs or have had any form of surgery for BPH in the past.
- Presence of any abdominal wall hernia
- History of surgery done for abdominal wall hernia in the past
- Seriously ill or bedridden patient.

Informed written consent was obtained from each of the cases and controls. All subjects were interviewed and examined by the single observer. Three independent variables mentioned below were assessed for both cases and controls

- International Prostate Symptom Score (IPSS)
- Prostate volume (PV)
- Uroflowmetric analysis – peak flow rate (PFR or Q max)

The prevalence of BPH in cases and controls were found out for each of the variables separately and the results were calculated.

Statistical analysis was done with SPSS software version 19. Univariate analysis was done for each parameter between the two groups. Chi square test and Unpaired T test were done and p value was calculated. A p value of <0.05 was taken as significant.

RESULTS

In this study, the cases were all males, aged between 41 years and 78 years with a mean age of 56 years. The controls were aged between 40 years and 73 years with a mean age of 56.06 years.

There was no significant difference in age distribution between the groups. The predominant age group was between 50-59 years among both the cases (35%) and controls (30%) (Figure 1). Among the cases, 38% had direct hernia, 59% had indirect hernia and 3% had recurrent hernia. The control subjects were having different illness such as hydrocele, cellulitis, gall stone diseases, haemorrhoids, fissure in ano, acid peptic disease/gastritis, skin swellings, pancreatitis, varicose veins.

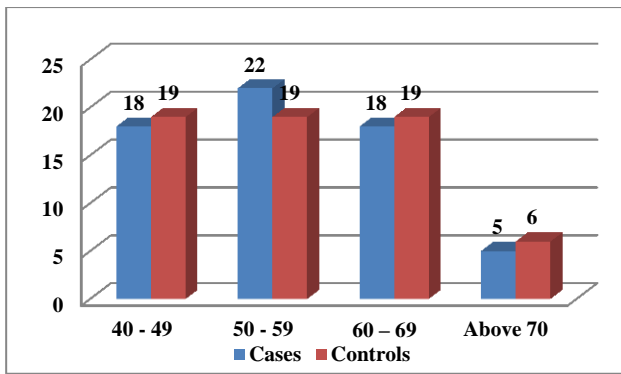


Figure 1: Age distribution among cases and controls.

IPSS score

The mean IPSS score was 6.24 among cases and 6.30 among the controls (Table 1).

Table 1: Mean values of different parameters among cases and controls.

Parameters	Mean values		P value
	Cases	Controls	
IPSS score	6.24	6.30	>0.05
Prostate volume (cc)	22.52	22.60	>0.05
Peak flow rate (Qmax) (ml/sec)	14.73	15.04	>0.05

Among the cases in this study, 22% patients were asymptomatic, 43% patients were mildly symptomatic, 32% were moderately symptomatic and 3% were severely symptomatic at the time of admission. Among the controls, 17% were asymptomatic, 48% were mildly symptomatic, 29% were moderately symptomatic and 6% were severely symptomatic (Figure 2). There was no statistically significant difference among the two groups.

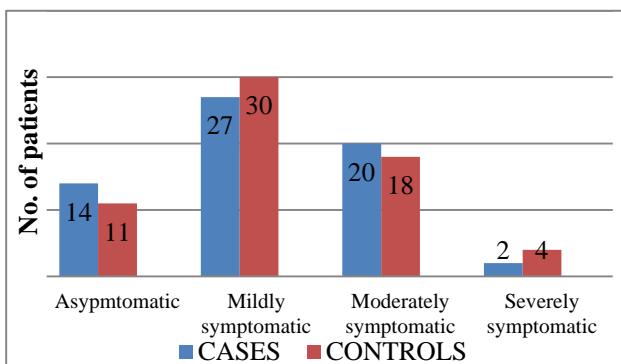


Figure 2: Symptom grading according to IPSS score.

Prostate volume

The mean prostate volume was 22.52 cc among the cases and 22.60 cc among the controls (Figure 1 and Table 1).

The cut off for prostate size, which was measured by transabdominal ultrasound, was taken as 25 cc or above which is termed as prostatomegaly and 32% of the cases and 29% among the controls had a prostate volume more than 25 cc (Table 2). However, the difference was statistically not significant.

Table 2: BPH based on prostate volume.

Group	Prostate volume		Chi square	P value
	<25 cc	≥25 cc		
Cases	43	20	0.151	0.423
Controls	45	18		

Uroflometric analysis

Uroflowmetric analysis was done for patients who were classified as having moderate and severe symptoms based on their IPSS scoring. Q Max was taken as a single most reliable factor to determine Benign Prostatic Hyperplasia. The mean Q max was 15.04 ml/sec in cases and 14.73 ml/sec among controls with a p value of 0.739 (Table 1). A value of less than 15 ml/sec was taken as significant and 21% of cases and among the controls, 17% had a Q max value of <15 ml/sec (Table 3).

Table 3: Q max values among cases and controls.

Group	Q Max		Chi square	P value
	<15 ml/sec	≥15 ml/sec		
Cases	13	9	0.573	0.324
Controls	11	12		

DISCUSSION

The mean IPSS score was 6.24 among cases and 6.30 among controls. The difference was statistically insignificant. The symptom severity was compared among the two groups and the results were statistically insignificant. Liao et al, states that calculating the IPSS scores and classifying the patients according to the severity is an easy and useful method and may act as a guide for the initial treatment, particularly for the primary care physicians who do not have access to urological studies.⁶ Reis et al, stated that the patients with inguinal hernia had a higher IPSS score than the patients without inguinal hernia. On the contrary, our study shows a lower IPSS score in the inguinal hernia group when compared with the control group. There is no literature evidence to state the reason for this.

The mean prostate volume among cases was 22.52 cc and among controls was 22.6 cc. The difference is statistically not significant. Kayalvizhi et al, conducted a prostate morphological study on prostate which showed that mean prostate volume ranges between 16.8 cc to 26.6 cc which is in accordance with the present study.⁷ In another study by Berges et al, conducted among patients who were aged 50 years and above, the mean prostate value was 30.5 cc.⁸

According to the Baltimore longitudinal study of aging, the mean prostate volume was 28.1 cc.⁹ The higher values in these studies may be due to the fact that these studies were conducted in patients aged above 50 years while in our study we have included patients from 40 years of age. In this study, 32% cases and 29% controls had prostate volume more than 25 cc with no statistical significance between two groups. The incidence of prostatomegaly is 41% above 50 years of age according to Mor et al.¹⁰ According to Bosch et al, there is an average increase of prostate volume by 2.2% yearly. In another population-based study, Rhodes et al, reported an average yearly prostate volume increase of 1.6%.¹¹ The lesser incidence in our study is because we have included patients from 40 years of age while the other studies have included patients above 50 years of age who naturally tend to have larger prostate volumes due to the annual increase in prostate size.

The mean Q max among patients with moderate to severe symptoms according to IPSS score is 14.73 ml/sec among cases and 15.04 ml/sec among controls. Urine flow studies are an important part in the diagnostic evaluation of BPH. Peak flow rate, also called as Q max, has more specificity in identifying patients with BPH. Men with LUTS and a normal Q max are likely to have non BPH related cause for their symptoms. Senturk et al, demonstrated that the mean Q max among patients with LUTS and inguinal hernia was 13.78 ml/sec which was in accordance to our results.¹² In another study by Sundaram et al, the mean Q max was 14 ml/sec, which was again in accordance with our study. Keeping the cut-off value at 15 ml/sec, 21% of cases and 17% of controls had Q max value <15 ml/sec.¹³

Even though in this study, the difference between cases and controls was not statistically significant, both mean Q max values and percentage of patients having Q max <15 ml/sec were higher among patients with Inguinal hernia than the patients without hernia. Q max being the best parameter to analyse the obstructive nature of BPH, a reasonable explanation for these values can be that the patients with obstructive voiding dysfunction due to BPH may need to strain for voiding, and this effort over time may have a direct impact on the abdominal wall, which in turn contributes to the development of IH. However, another possibility remains on the fact that Inguinal Hernia and BPH are part of the aging process which is due to various functional and anatomic disorders.

Urinary retention is a well-known post-operative complication in many different surgical branches. This often requires urethral catheterization which by its own has a lot of complications like urethral trauma, catheter related infections, and also increasing the overall hospital costs. In a study by Sivasankaran et al, among the patients with post-operative urinary retention after Laparoscopic hernia repair, 41% had BPH.¹⁴ In another study by Patel et al, it is stated that 14% of patients with urinary retention after inguinal hernia repair have BPH.¹⁵

There are various studies now that stresses the importance of combining inguinal hernia repair and prostate surgery in a single session. Combining these two procedures under a single session has many advantages like patient satisfaction, decreased duration of hospital stay, quicker recovery and reduced overall hospital costs.¹⁶ There are certain studies that suggest an increase in the rate of wound infection following this combined procedure. But, with the advent of trans-urethral resection of prostate (TURP), this has drastically reduced.¹⁷ In a study by Khiari et al, on post-operative inguinal wound infection following a combined inguinal hernia repair with open suprapubic prostatectomy and transurethral resection of prostate (TURP), the incidence of wound infection was 5% and 4%, respectively. They concluded that the combined repair of inguinal hernias and surgery for prostatic disease is both effective as well as technically feasible, and their results are favourable when compared to hernia repair and prostatectomy done separately.¹⁸ In another study by Bawa et al, on combined TURP and mesh hernioplasty, there was no wound or mesh infection postoperatively and there was no significant increase in operating time which was ~55 minutes.¹⁰ In another study by Oathman et al, there was not any post-operative wound infection or mesh infection following the combined procedure.¹⁷

CONCLUSION

None of the parameters analysed showed a statistically significant difference between the two groups. The results suggest that there is no statistically significant association between inguinal hernia and BPH. They are just two pathologies that are present together in increasing frequency among the elderly. In spite of no statistical significant association between inguinal hernia and BPH, the concurrent presence of both the diseases requires treatment for both as they affect the quality of the patient's life significantly. Hence, combined treatment for both the diseases should be the preferred line of management. Also, IPSS scoring should be administered in all the patients who are admitted with inguinal hernia for early diagnosis of lower urinary tract symptoms associated with BPH for combined management of both the diseases.

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Conflict of interest: None declared

Ethical approval: The study was approved by the Institutional Ethics Committee

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