

Preoperative International Prostate Symptom Score as a Predictor of Postoperative Urinary Retention in Patients of Inguinal Hernia Surgery: A Prospective Observational Study

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ABSTRACT

Introduction: The International Prostate Symptom Score (IPSS) is a self-reported questionnaire intended to evaluate the severity of Lower Urinary Tract Symptoms (LUTS) in individuals with prostate conditions such as benign prostatic hyperplasia. It can assign a severity level (mild, moderate, severe) for individuals experiencing urine symptoms. Postoperative urinary retention is one of the significant complications following any surgical procedure, among all age groups, regardless of prior history of urinary problems.

Aim: To evaluate the role of preoperative IPSS in predicting Acute Urinary Retention (AUR) in patients undergoing hernioplasty.

Materials and Methods: The present prospective observational study was conducted at KS Hegde Medical Academy, Mangaluru, Karnataka, India, from January 2019 to June 2020 on a study population of 100 male patients. These patients were assessed with

the IPSS IX questionnaire preoperatively for urinary tract symptoms. This was graded into mild (0-7), moderate (8-19) and severe (20-35) categories. They were observed for the incidence of urinary retention in the postoperative period. Subsequently, a comparison is made between IPSS and postoperative urinary retention.

Results: The mean age of the study population was 59.57±9.07 years. Out of 100 males studied, six patients developed AUR. One patient out of 71 patients who had mild IPSS and five patients out of 29 patients with moderate IPSS developed AUR. Patients with higher IPSS were found to have a higher chance of AUR (p-value=0.005).

Conclusion: According to the present study findings it was observed that patients with inguinal hernias who have higher IPSS scores have a higher incidence of urinary retention postoperatively.

Keywords: Abdominal pain, Hernioplasty, Hyponatremia, Lower urinary tract symptoms

INTRODUCTION

It is observed that 75% of all abdominal hernias account for inguinal hernias [1]. Multiple aetiological factors, such as chronic lung disease, chronic cough, pregnancy, ascites, constipation and occupations involving lifting of heavy weights, etc., are some of the noticeable causes of inguinal hernia, leading to an elevation in intra-abdominal pressure. Apart from this, Urinary symptoms may co-exist, which require evaluation and further management before surgical correction of the hernia defect [1].

AUR is defined as “the sudden inability to void, usually associated with bloating, severe urgency, general distress, lower abdominal distension and suprapubic pain” [2,3].

Postoperative Urinary retention is one of the significant complications following any surgical procedure, despite age and sex, occurring in 12-15% of patients [2-6]. The known risk factors for AUR after hernioplasty are observed to be increasing age, Benign Prostatic Hyperplasia (BPH) and delayed mobilisation, etc. This can lead to postoperative urinary tract infection, causing discomfort and anxiety, extending the hospital stay and increasing the cost of treatment [2]. The IPSS is found to be an easy method and has been widely adopted as a reliable method of detecting and categorising the severity of LUTSs [7].

The present study aimed to evaluate the role of preoperative IPSS in predicting AUR in patients undergoing hernioplasty.

MATERIALS AND METHODS

The present prospective observational study was conducted at KS Hegde Medical Academy, Mangaluru, Karnataka, India in a tertiary

care hospital between January 2019 and June 2020. After obtaining clearance from the Institutional Ethics Committee (No.INST-EC/EC/180201819), this study was conducted. All the patients fulfilling the inclusion criteria during the study period were included.

Inclusion and Exclusion criteria: Subjects diagnosed with an inguinal hernia without any prior history of urinary retention or urinary tract procedures were included. All patients with complicated inguinal hernia, urethral strictures, electively catheterised patients and those unwilling to participate were excluded from the study.

Study Procedure

The patients presenting with inguinal hernia were examined clinically and evaluated by the operating surgeon after obtaining informed written consent. After a thorough pre-anaesthetic check-up, the patients underwent open inguinal mesh hernioplasty under spinal anaesthesia. Intraoperatively, the hernia sac was identified, opened and contents were subsequently reduced. A prolene mesh was reinforced with 2.0 polypropylene sutures placed intermittently. The amount of bleeding (mL), Operative time (in minutes) and Intraoperative fluid administration (in mL) was documented at the end of the surgery.

The patient was given an IPSS questionnaire preoperatively and information about the symptoms and score was assessed by the primary investigator. The IPSS questionnaire contains eight items, with seven questions on symptoms (urinary frequency, interrupted stream, feeling of incomplete emptying, weak stream of urine, urinary hesitancy, urinary urgency and nocturia) and one question on the level of satisfaction of the patient with their present

urinary condition. Three groups were made on the severity of symptoms:

- Mild score of 0 to 7;
- Moderate score 8 to 19 and;
- Severe score of 20 to 35 [7].

Postoperatively, the patient was observed for the incidence of precipitated urinary retention and increased urinary disturbances over 48 hours. Following this, a comparison was made between IPSS and postoperative urinary retention. The outcome measured was incidence of AUR postoperatively.

STATISTICAL ANALYSIS

The data was then analysed using Statistical Package for Social Sciences (SPSS) v25. The descriptive data were represented as frequency, percentage, median and interquartile range. Chi-square test was used to determine the association for categorical variables. The p-value <0.05 at a confidence interval of 95% was considered significant.

RESULTS

The study population included 100 male study participants. The mean age of the population was 59.57±9.07 years. A total of 36 percent of the population were between 61-70 years of age [Table/Fig-1].

Age	Frequency	Percent
45-50 years	20	20.0
51-60 years	34	34.0
61-70 years	36	36.0
71-80 years	10	10.0
Total	100	100.0

[Table/Fig-1]: Age distribution of the study population.

When the co-morbidities were assessed, 20 patients were known to have diabetes mellitus and 23 patients were known to have systemic hypertension. Among the total study population, 27 patients were smokers and six patients were known to consume alcohol. The family history of the individual patients in the study population revealed that 12 patients had a family history of diabetes mellitus and five patients had a family history of systemic hypertension.

Hernia type	IPSS score				Total	
	Mild		Moderate			
	Count	%	Count	%	Count	%
Direct	44	62.0%	23	79.3%	67	67.0%
Indirect	27	38.0%	6	20.7%	33	33.0%
Total	71	100.0%	29	100.0%	100	100.0%

[Table/Fig-2]: Comparison of the type of hernia to the IPSS score.

Chi-square value=2.80 Df= 1 p-value=0.07

Parameters	Age								p-value
	41-50		51-60		61-70		>70		
	Count	%	Count	%	Count	%	Count	%	
IPSS									
Mild	20	100%	29	85.3%	22	61.1%	0	0%	0.005*
Moderate	0	0%	5	14.7%	14	38.9%	10	100.0%	
AUR									
Yes	0	0.0%	1	2.9%	3	8.3%	2	20.0%	0.129
No	20	100.0%	33	97.1%	33	91.7%	8	80.0%	
Laterality of hernia									
Unilateral	20	100.0%	28	82.4%	27	75.0%	9	90.0%	0.097
Bilateral	0	0.0%	6	17.6%	9	25.0%	1	10.0%	

[Table/Fig-3]: Association of age with prostate size, IPSS score, laterality of hernia and Acute Urinary Retention (AUR).

Chi-square test was used

Preoperative IPSS score analysis showed 71 percent of the study population had a mild score, 29 percent of the study population had a moderate score and none of them had a severe IPSS score. One patient out of 71 patients who had mild IPSS and five patients out of 29 patients with moderate IPSS developed AUR. Patients with higher IPSS were found to have a higher chance of AUR (p-value=0.005).

Out of 71 patients who had a Mild IPSS score, 44 patients had a direct inguinal hernia [Table/Fig-2]. Out of the total patients studied, 67 patients had direct inguinal hernia, of which four patients developed AUR and 33 patients had indirect inguinal hernia, of which two patients developed AUR.

Among the 100 patients who were studied, 84 patients had a unilateral inguinal hernia and 16 patients had a bilateral inguinal hernia. Out of 84 patients with unilateral inguinal hernia, 63 patients had a mild IPSS score, while 21 patients had a moderate IPSS score. Out of 16 patients with bilateral inguinal hernia, eight patients had a mild IPSS score and eight patients had a moderate IPSS score.

In this study, out of six patients who developed AUR, five patients had a moderate IPSS score and one patient had a mild IPSS, which showed statistical significance (p-value=0.005).

As the age of the patient increases, the IPSS scores are found to be increasing, which is statistically significant. With the increase in age of the patient, the size of the prostate is increased and is found to be statistically significant [Table/Fig-3].

DISCUSSION

AUR can have a significant influence on operative morbidity, hospitalisation and recovery during the post-hernioplasty period [2]. Smith DR and later Goldman G showed that non-invasive tests accurately predict the occurrence of postoperative urinary retention [8,9]. In the present study, the IPSS score was used to predict the AUR post-hernioplasty. All 100 men with a hernia in this study, were assessed preoperatively with the IPSS questionnaire and the score was measured. Among them, 6 (6%) patients developed AUR post-hernioplasty.

In the study by Blair AB et al., a total of 445 patients were studied; among 227 patients, 27 (10.6%) patients developed postoperative urinary retention after open hernioplasty and among 168 patients who underwent laparoscopic hernia repair, 23 (12%) patients developed postoperative urinary retention [2]. In the study by Ferzli G et al., the rate was reported as 1.6%, in the study of Winslow ER et al., it was 7.9%, in Koch CA et al., study it was 22.2% and in Lau H et al., study it was reported to be 4% [10-13].

Fazeli F et al., have done a study in which every patient completed an IPSS questionnaire form prior to the surgery and classified into mild, moderate and severe according to their scores [14]. Out of 114 elderly male patients, 8 (7%) patients had postoperative urinary

retention in the first 24 hours of surgery. Of the eight patients who had urinary retention, two patients had moderate symptoms and 6 patients had severe symptoms. Patients who were having mild symptoms when compared to patients who were having severe symptoms, a significant difference was found in patients developing postoperative urinary retention (p -value=0.025).

Elkhodair S et al., in their study, observed that patients with mild IPSS had 17.7%, patients with moderate IPSS had 55.5% and patients with severe IPSS had a 100% chance of developing AUR [15].

Increased patient age is a risk factor that has frequently been identified to be correlated with postoperative urinary retention. Studies done by Blair AB et al., Patel JA et al., Sivasankaran MV et al., Shadle B et al., have shown that patients of advanced age are at increased risk of postoperative urinary retention following hernioplasty [2,16-18].

Limitation(s)

Unequal distribution of patients with lower urinary symptoms presenting with hernia in each age group. Smaller study population. Lack of long-term follow-up on urinary function. Did not include urodynamic evaluation or prostate volume in all patients.

CONCLUSION(S)

Patients with moderate IPSS scores with inguinal hernia have a higher incidence of urinary retention postoperatively. The patients with moderate symptoms need to be counselled preoperatively and the possibility of AUR should be explained.

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