

## ASSOCIATION OF INTRAVESICAL PROSTATIC PROTRUSION GRADE AND THE OUTCOME OF ALPHA BLOCKER TREATMENT FOR BLADDER OUTFLOW OBSTRUCTION

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**Abstract:** Benign Prostatic Hyperplasia (B.P.H) affects up to 80% of men older than 45 years of age worldwide, half of whom will eventually require treatment for its clinical manifestations such as bladder outflow obstruction (BOO) and its associated symptoms. There are various treatment strategies for B.P.H; alpha blockers being the most commonly employed. However, the outcome of said pharmacologic agent in treatment of BOO, in the presence of intra-vesical prostatic protrusion (IPP) of varying grades is less researched. The aim of the current study was to study the association IPP grade and the outcome of BOO treatment among patients with BPH. This prospective cohort comprised of a sample of 100 B.P.H patients, aged  $\geq 45$  years (chosen via non-probability – consecutive sampling), presenting to Ziauddin University Hospital, Karachi from June 2019 to December 2019. After taking written informed consent, data was recorded onto a pre-structured questionnaire containing inquiries pertaining to basic biodata, sociodemographic details, disease particulars, treatment outcome (gauged using IPSS, UFM and PVR) assessed at first contact and again after 1 and 3 months. The data obtained was analyzed using SPSS v. 21.0. The mean age of the sample stood at 68 years ( $SD \pm 10.3$ ). The mean prostate size was recorded to be 58 cm<sup>3</sup> ( $SD \pm 32$ ). The commonest grade of IPP was II (45%), followed by grade I (29%) and grade III (24%). The cumulative treatment outcome was poor, with only a meagre improvement (9.1% in IPSS score, 4% in UFM value and 13% in PVR) was recorded. Stratification revealed that the treatment outcome became progressively worse with increasing grade of IPP. After careful consideration, it can be concluded that the outcome of alpha blocker treatment for BOO among patients with IPP is poor. IPP serves to seemingly dampen the effect of alpha blockers with increasing grades corresponding to progressively worse outcome. Thus, additional modalities may be employed to supplement alpha blocker treatment for better patient outcome among patients with IPP.

**Keywords:** Alpha Blocker Treatment, Bladder Outflow Obstruction, Intravesical Prostatic Protrusion, International Prostate Symptoms Score (IPSS) & Benign Prostatic Hyperplasia (BPH).

### Introduction

The human prostate is the seat of three major causes of morbidity; prostatitis, prostate cancer and benign prostatic hyperplasia (BPH) (Lokeshwar et al., 2019). BPH is a nonmalignant enlargement of the prostate gland and is among the commonest diseases in ageing men. BPH affects 50% to 80% of men older than 45 years of age (de la Rosette et al., 2001). Of these men, half will eventually require treatment for its clinical manifestations such as BOO and its associated symptoms namely polyuria, dysuria, hesitancy, weak stream and urinary tract infection, etc (Roehrborn, 2011).

BPH is managed conservatively, medically or surgically. Uroselective alpha blockers hold a

cornerstone place for the treatment of BPH. They produce their effect by blocking of Alpha 1-a receptors which leads to relaxation of bladder neck and external sphincter thus reducing bladder outflow obstruction (Fox and Brotchie, 2010). Alpha blockers are indicated as first line of treatment for the patients who have moderate to severe BOO secondary to BPH without any complications (Dias, 2012).

Alpha-1-adrenergic receptor blockers (such as tamsulosin, doxazosin, prazosin, and terazosin) cause an increase in peak urinary flowrate (Q<sub>max</sub>) and a reduction in symptoms. However, it is not well established that which group of patients will

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respond to alpha blocker treatment. It is only determined after a trial of alpha blocker treatment. The treatment outcome is gauged using basic evaluation tools including, ultrasonography of prostate [to ascertain size of prostate and ascertain Post Void Residual Volume (PVR) of Urine), uroflowmetry to determine peak flowrate and symptomatic assessment using validated tools, such as the International Prostate System Score (IPSS) (Dias, 2012). However, no gold standard of treatment is defined, and many factors influence the final outcome.

Research suggests that the outcomes of alpha blocker treatment may correlate grade of Intravesical Prostatic Protrusion (IPP). IPP signifies a change in the morphological structure of the prostate which entails protrusion into the bladder while the prostate is undergoing enlargement. The median lobe is particularly implicated in leading to BOO of 'valve ball' nature in turn affecting the urine outflow. Additionally it distorts the funnel like shape of the bladder neck and (Awan et al., 2019; Miklos et al., 2018).

It is reported that increased IPP due to an enlarged prostate may aggravate storage symptoms as a consequence of elongation of the prostatic urethra and increased stimulation of the bladder neck and trigone. Consequently, it may aggravate the storage and voiding symptoms. Hence the condition increases the already high level of morbidity associated with BPH and merits effective treatment (D'Agate et al., 2020; Nunzio\* et al., 2019).

Trials of alpha blocker treatment conducted among patients yielding mixed results. Furthermore, the treatment outcome of BOO with different grades of IPP has seldom been recorded. This research hopes to fill this important knowledge gap.

**Methodology**

This prospective cohort comprised of a sample of 100 B.P.H patients, aged ≥ 45 years (chosen via non-probability – consecutive sampling), presenting to Ziauddin University Hospital, Karachi from June 2019 to December 2019. After taking written informed consent, data was recorded onto a pre-structured questionnaire containing inquiries pertaining to basic biodata, sociodemographic details, disease particulars, treatment outcome (gauged using IPSS, UFM and PVR) assessed at first contact and again after 1 and 3 months. The data obtained was analyzed using SPSS v. 21.0.

**Results**

The mean age of the sample stood at 68 years (SD ± 10.3). 96% of the individuals were married and only 18% were active smokers. The mean prostate size was recorded to be 58 cm<sup>3</sup> (SD ± 32). The size distribution is further tabulated below in table 1.

The commonest grade of IPP was II (45%), followed by grade I (29%) and grade III (24%). The cumulative treatment outcome was poor across all parameters and only a meagre net cumulative improvement i.e. 9.1% in IPSS score, 4% in UFM value and 13% in PVR was recorded (Table 2).

**Table 1: Distribution of prostate size in study population:**

Mean Prostate Size (cm <sup>3</sup> )	Distribution (%)
≤ 25	12
26 to 50	48
51 to 75	17
76 to 100	13
≥ 101	20

**Table 2 Treatment Outcome of Evaluated parameter in the study population:**

Alpha Blocker Treatment	Treatment Outcome Evaluation Parameter		
	IPSS	UFM (ml/sec)	PVR (ml)
Net Change	02	0.4	38
% Change	9.1%	4%	13%
P Value	> 0.05	> 0.05	> 0.05

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**Table 3: Stratification revealed that the treatment outcome became progressively worse with increasing grade of IPP.**

Treatment Duration	Treatment Outcome Evaluation Parameter								
	IPSS			UFM (ml/sec)			PVR (ml)		
	IPP Grade			IPP Grade			IPP Grade		
	I	II	III	I	II	III	I	II	III
Baseline	18	21	26	10.6	8.2	6.18	279	283	301
1 Month	17	20	26	10.8	8.2	6.16	261	275	289
3 Months	16	17	26	10.9	8.4	6.16	243	255	271
Net change	02	04	-	0.3	0.2	0.02	63	28	30
% Change	11%	19%	-	2.8%	2.4%	0.3%	22.6%	10%	10%
P Value	>0.05	> 0.05	-	>0.05	>0.05	> 0.05	<0.05*	> 0.05	> 0.05

**Discussion**

The incidence of urodynamically proved bladder instability increases from 20 to 47 percent in men older than 50 years and thus it comes as no surprise that the mean age of the sample in this research stood at 66 years (SD ± 10.3). Hence with increasing age, men should be more vary of BOO and get timely and regular clinical evaluation to avert any problems (Patel et al., 2020).

It is also reported that more severe IPP correlates with greater probability of aggravation of BOO. Many researchers have attempted to study the correlation between BOO and IPP, but the focused has largely remained the prostate morphology and BOO. This research however adopts a clinical approach and focusses on severity of IPP and treatment outcome. It is revealed that more severe IPP grades were almost resistant to the administration of alpha blockers (Chia et al., 2003). When treated with alpha blocker treatment, the mean improvement (as is evident from either of the parameters) the outcome was poor in this research suggesting that IPP hampers symptom alleviation following alpha blocker treatment and limits the ability of the treatment to decrease the morbidity (Lee et al., 2010).

The results of this study are synonymous with those in literature. Recent research analyzed patients treated with alpha blocker and revealed that an approximate forty percent of the grade 3 IPP patients were treatment non-responders and achieved more grim outcomes than grade 1 IPP patients at the end of treatment (3 months). More recently, it is unearthed that IPP correlates with poorer treatment response thus a markedly negative association between IPP-post treatment IPSS (Park

et al., 2013; Park et al., 2012).

The aforementioned evidence, generated from the research and yielded by literature reviews serve to highlight the fact that alpha blocker, to a large extent, is a viable treatment option for LUTS among patients with and without IPP likewise. However, it is important to note that the treatment response is milder and at times, less that desirable among patients with IPP. Thus, adjunct treatment options that may work in harmony with current alpha blocker treatment to produce a better treatment response should be explored.

**Conclusion**

After careful consideration, it can be concluded that the outcome of alpha blocker treatment for BOO among patients with IPP is poor. IPP serves to seemingly dampen the effect of alpha blockers with increasing grades corresponding to progressively worse outcome. Thus, additional modalities may be employed to supplement alpha blocker treatment for better patient outcome among patients with IPP.

**Conflict of interest**

The authors declared an absence of conflict of interest.

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