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Clinical study of outcome in the management of BPH with obstructive nephropathy

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Abstract
Background: Benign Prostate Hyperplasia (BPH) is a common disease in adult men and its incidence is age related. While the underlying mechanism for developing renal failure associated with benign prostatic hyperplasia is likely multifactorial and co-morbid factors in elderly men may contribute to renal impairment. We aimed that to determine the association of benign prostatic obstruction with nephropathy.
Materials and Methods: A Prospective study was conducted at JSS Hospital, Karnataka, between June 2010 to June 2012. A total 30 patients were included after informed consent. Blood samples were collected from all the subjects. IPSS, QoL Score, Residual urine, Serum Creatinine, Prostatic volume and Hemodialysis was done.
Results: The present study evaluates the IPSS and QoL Score, Residual urine, Serum Creatinine, Prostatic volume and Hemodialysis in patients with BPH showed a positive relation with nephropathy. Along with that we analyzed all the parameters pre and post OP IPSS (24.75 ± 1.88, 14.27±3.66), QoL Score (4.65 ±0.66, 1.93±0.75), Residual urine442.48±225.65, 44.89± 47.50), Serum Creatinine (3.04± 2.13 1.28±0.49), and Hemodialysis (3(10%), 2 (6%).
Conclusion: This study concludes Strong inter-relation between the two such that BPH can cause renal failure while renal failure can influence the management of BPH and its outcome.

Keywords: BPH, Serum Creatinine, Obstructive Nephropathy.

Introduction
Benign Prostate Hyperplasia (BPH) is a common disease in adult men and its incidence is age related. Prevalence of BPH is approximately 25% in men aged 40 to49 years, 50% in men aged 50 to 59 years and 80% in men aged 70 to 79 years [1]. If we have to go by the natural history of the disease progression of BPH and its complications 13.6% of patients who presented to undergo TURP were in renal failure [2]. As we understand that these patients with BPH whether symptomatic or asymptomatic, if left untreated may present with renal failure which could be chronic or acute. Despite the many possible causes of renal failure in elderly patients, the common causes were BPH (38%), neurogenic bladder (19%), obstructive pyelonephritis (15%) [3].

TURP remains the gold standard surgical procedure for treatment of these cases. However, patients in renal failure have an increased risk for complications after TURP compared with patients with normal renal function, so we wanted to study the treatment outcome and complications associated with its management [4]. Attending to high prevalence of BPH in older men with CKD it is invaluable to take into consideration the relationship between these two clinical entities. However, despite the high prevalence of renal failure and BPH in elderly men, there is limited knowledge on the association between these two conditions, there is very little information in the literature regarding the role of only BPH as a causative factor in causing renal failure and its treatment outcome [5]. Based on this background the present study was evaluates the clinical study of outcome in the management of BPH with obstructive nephropathy.

Materials and Methods
A Prospective Study of 30 Consecutive Cases with Obstructive Nephropathy Secondary to BPH Study was conducted at JSS Hospital between June 2010 to June 2012. A total 630 subjects screened at our institute during the study period, out of which patients who had associated renal failure (143 patients) on the basis of serum creatinine value were selected.

Among the patients who had BPH with renal failure cases which satisfied the inclusion criteria 30 patients were selected and rest of the cases with other medical conditions such as diabetes, hypertension, prostatic malignancy, causes of obstructive uropathy other than BPH were excluded. All the subjects were recruited in the study after obtaining their informed consent after obtaining of ethical clearance from the institute. From the all subjects, after overnight fasting (12hrs), 3 ml of venous blood was collected transferred into plain tube. The collected samples were separated by centrifugation at 3000 rpm for 3 min and stored until biochemical analysis was done. International Prostate Symptom Score (IPSS), QoL = Quality of life, Residual urine, Prostatic volume, Hemodialysis and Serum Creatinine were measured by modified jiffy's method laboratory standard methods.

Statistical analysis

The Descriptive procedure displays univariate summary statistics for several variables in a single table and calculates standardized values. Categorical variables were tested using Chi-square test. Comparisons between two groups for continuous variables were assessed using Paired samples t test. The Bivariate Correlations procedures computes Pearson's correlations coefficient. Correlations measure how variables or the Rank orders are related. Multinomial Logistic Regression is useful for situations in which you want to be able to classify subjects based on values of a set of predictor variables. Statistical analysis was performed using Microsoft Excel spread sheets, PSS software for windows version 16. A $P < 0.05$ was considered statistically significant.

Results

Table – 1In the study population comparison of various variables which could influence the outcome were compared between the group which improved and the group which did not improve by the method of comparison of mean and to know its statistical significance by calculating the p value. Patients who improved after TURP surgery were younger with a mean age of around65 years than patients who did not improve whose mean age, IPSS, QoL score, Residual urine, Serum creatinine and prostatic volume was around 72 years which was found to be statistically significant (p value=0.0001).

Table 1: Showed the demographic characteristics between clinical factors Vs Outcome

Clinical factors Vs Outcome					
VARIABLES	Outcome				P value
	Improved N=23		Not improved N=7		
	Mean	SD	Mean	SD	
Age	65.4783	6.98615	72.4286	3.73529	**0.018**
Duration of symptoms	88.5652	119.99539	152.1429	97.37630	0.213
IPSS	24.4783	1.87979	26.1429	1.67616	**0.045**
QoL	4.5652	.58977	5.0000	.81650	0.130
Residual Urine	463.5652	236.32428	360.0000	156.92355	0.288
Baseline Sr.Creatinine	2.4565	.99262	5.3857	3.36622	**0.001**
USG Prostate	45.5652	16.67558	44.4286	16.52127	0.875

Table 2: Symptomatic improvement, improvement in renal functions and ability to void spontaneously with minimal residual urine the above-mentioned variables were compared in the pre-op and post-op follow up. There was very significant improvement in symptom and quality of life, renal function and voiding pattern which was all found to be statistically very significant (p value=0.000). Dialysis was required in 3(10%) patients in the pre-operative period and 2(6%) patients continued to require Hemodialysis in the post-operative period.

Comparison of pre-op vs post-op variables					
Paired Variables	Pre-op N=29		Post-op N=29		P value
	Mean	SD	Mean	SD	
IPSS	24.7586	1.88329	14.2759	3.66349	**0.000**
QOL	4.6552	0.66953	1.9310	0.75266	**0.000**
Serum creatinine	3.04	2.13	1.28	.49	**0.000**
Residual urine	442.4828	225.65	44.8966	47.50515	**0.000**
Hemodialysis	3(10%)		2(6%)		

Table 3: The patients who had complications were analysed by comparing each complication with other variables such as basal renal function, duration of presenting symptoms and residual urine between the groups who had that particular complication with other group who did not have that particular complication by the method of comparison of means.

Analysis of complications		
VARIABLES	Refractory Renal failure	
	Yes N=3	No N=27
	Mean	Mean
Basal serum creatinine (mg/dl)	6.35	2.64
Duration of symptoms (days)	130	88.5
Residual urine (cc)	328.3	463

Table 4: The association of hypotonia on Urodynamic study with increased complication rate was found to be statistically significant even on multinomial logistic regression analysis.

Variable	Adjusted Odds Ratio	95% C.I.		P-Value
		LL	UL	
Age(If <70 or >70years)	13.3655	0.5261	339.5151	0.1162
Creatinine (if <3 or >3)	11.7409	0.4845	284.5318	0.1299
Trabeculations (Grade II/III)	1.1202	0.0439	28.5846	0.9453
UDE (Hypotonia/normal)	27.17	1.026	769.23	0.0491

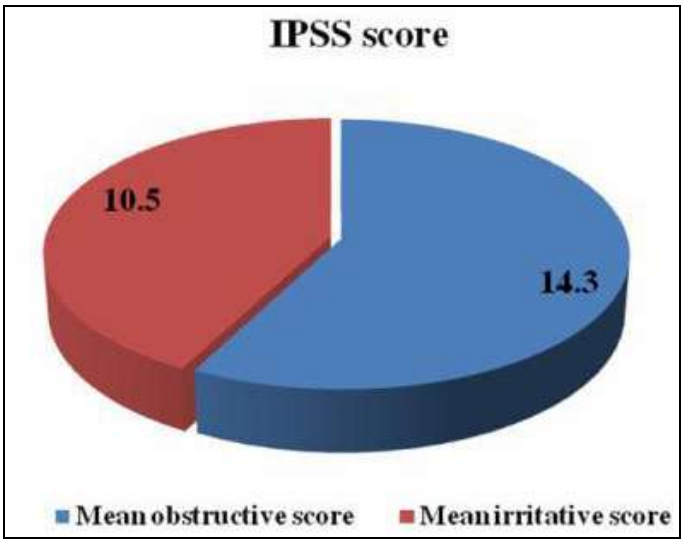

Fig 1: Shows the IPSS Score between obstructive score as well as irritative score, mean irritative score having more than mean obstructive score.

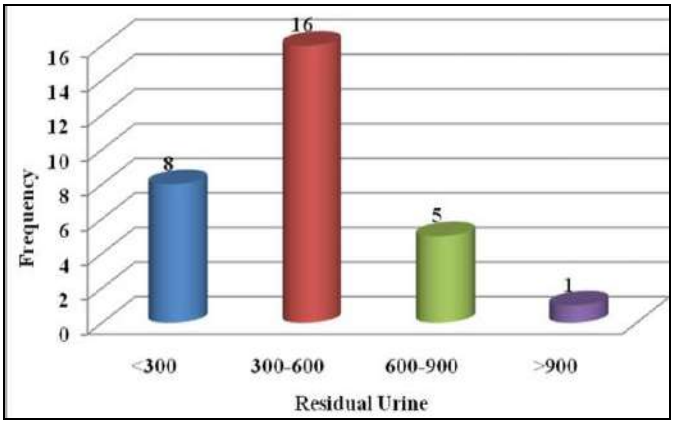

Fig 2: Showed the residual urine data distribution

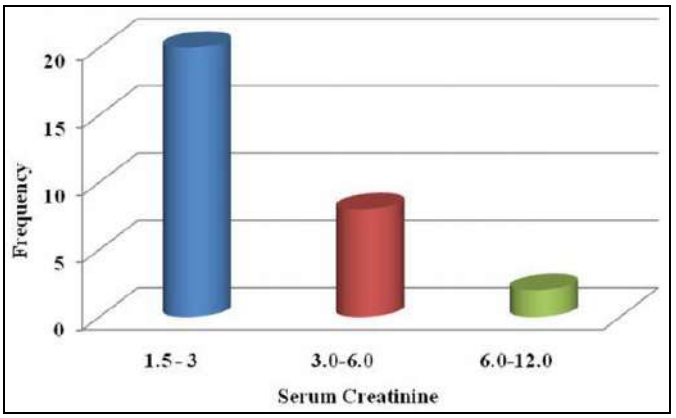

Fig 3: Shows the comparison of different concentrations of serum creatinine

Discussion

Benign Prostate Hyperplasia (BPH) is a common disease in ageing men with a prevalence of 50% above 50 years and increasing up to 80% in men above 80 years. In our institute it was observed that many patients who presented with obstructive Lower Urinary Tract Symptoms secondary to BPH had associated renal failure. While the underlying mechanism for developing renal failure associated with BPH is multifactorial and co-morbid factors such as diabetes, hypertension, etc in elderly men may contribute to renal impairment [6]. In our study the mean incidence of BPH with renal failure was 11.2%. Which was comparable with the other studies. The AHCPR BPH Guidelines report a mean of 13.6% of renal failure [7, 8]. In another study there was are ported incidence of 11% in patients with renal failure secondary to BPH [9]. Previous study's reported that More recently a cross-sectional survey in Spain of 2,000 randomly sampled men who were 50 years or older showed a 2.4% prevalence of self-reported renal failure related to a prostate condition (9% reported renal failure from any cause) [10]. Another study21 showed that men presenting for

prostate surgery had a 7.7%prevalence of renal failure compared to a 3.7% prevalence in age matched men presenting for no prostate surgery [11].

All the patients had an IPSS suggestive of severe lower urinary tract symptoms with bothersome quality of life score being unhappy and it was also observed that major contribution in their IPSS were from obstructive symptoms as compared to irritative voiding symptoms. Most of the patients have characteristic symptoms such as nocturia, urgency, weak urinary stream, a sense of incomplete bladder emptying, straining during micturition, increased micturition frequency and dribbling during or after urination [12]. Chronic urinary retention as consequence of BPH has been defined as a palpable bladder that corresponds to a high PVR34 and most of the patients with chronic urinary retention have an indolent and progressive disease, with worsening of urinary symptoms and the majority of these patients just seek for medical care in bad health conditions with sharp renal insufficiency [13].

In our study most of the patients had severe symptoms with poor quality of life. In spite of having such severe symptom score the delay in seeking medical attention could be attributed to lack of health awareness as most of our patients were from rural setup and also due to the fear of surgery. Many of these patients were silent sufferers and postponed their medical visits till their symptoms became very severe or were precipitated by acute attacks of urinary retention [14]. In our study serum Creatinine (SC) and Creatinine clearance (Cr. Cl) were taken as criteria for defining renal insufficiency.

Serum Creatinine of 1.4mg/dl & Cr. Cl of60ml/min/1.73m2 were taken as the cut-off, a value above which were included in the study. We further arbitrarily categorized the patients with high serum creatinine under 3 groups; patients with serum creatinine levels of 1.5-3.0; 3.1-6.0 and 6.1-12 to quantify the severity of the renal insufficiency [15]. In our study most of the patients 20(67%) had their SC between 1.5-3.0 mg/dl, 6(26.6%) patients had serum creatinine between 3-6mg/dl and 2(6.4%) patients had serum creatinine above 6mg/dl.

Analysis of certain important clinical and biochemical variables such as IPSS, QoL score, basal renal functions, voiding pattern (as reflected by residual urine), persistence of hydroureteronephrosis, need for dialysis were compared in the pre and post-operative period to determine the role of surgery-TURP in influencing these factors. It was found that there was a statistically significant (p value=0.000) [16].

However only the association of hypotonic on Urodynamic study with increased complication rate was found to be statistically significant even on multivariate analysis. The association of parameters other than hypotonic on Urodynamic study, which were found to be significant on univariate analysis were not found to be statistically significant in increasing the rate of complication on multivariate analysis suggesting bladder hypotonia as an independent risk factor in predicting the final outcome in patients with renal failure.

Conclusion

Increasing incidence of BPH with Renal failure, the role of BPH in causing renal failure has been well established which are also strongly influenced by severity of obstructive symptoms and degree of bladder hypotonia.

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