

“A Retrospective Analysis Of Incidentally Detected Prostate Cancers In Cases Of Bladder Outlet Obstruction Undergoing TURP At a Tertiary Care Centre”

- 1) **Dr Guddi Rani Singh(MD)**,Assistant Professor, Department of Pathology, Mob no-9955431290,email id- drgrsinghpatho@gmail.com, ORCID no-0000-0001-8547-1212
- 2) **Dr Ravi Bhushan Raman(MD)**,Assistant Professor, Department of Hematology, Mob no- 7903877074,
email id- bhusanravi89@yahoo.co.in., ORCID no-0000-0002-7954-4363
- 3) **Corresponding author: Dr Shabana Azad(MD)**,Senior Resident, Department of Pathology, Mob no-7359902902,
Email id-shabazad18@gmail.com, ORCID no-0000-0001-6803-9428

Background-

Second most common cancer in man is prostatic carcinoma and is very important cause of morbidity and approximately 6.7% mortality, worldwide^{1,2}.Incidental prostate carcinoma is defined as subclinical and asymptomatic tumor that is neither palpable nor visible by imaging. They are diagnosed only at the time of transurethral resection of the prostate(TURP) for benign prostatic hyperplasia(BPH)².TURP targets mostly the transitional zone of the prostate, but the Prostatic carcinoma isolated in transitional zone is uncommon, and a few tumour may not cause a increase in PSA, especially in case of low volume^{3,4}.

In various studies in the literature, the prevalence of IPC is reported to vary between 1.4 to 16.7%⁵. Although the incidence of IPC in TURP specimens has been markedly decreased due to the widespread use of serum PSA screening.

Along with this shift in incidental prostate cancer distribution with introduction of PSA, newer techniques, such as laser vaporization, are being performed⁶. But these newer technologies do not provide tissue for pathological examination leading to potential for missing the detection of incidental prostatic carcinoma.

Most IPCs are considered clinically insignificant, but in recent few studies , It has been suggested that in some cases the clinical course becomes more unfavourable⁸.Some IPCs have been shown to be clinically significant, specifically tumours with higher Gleason score and Stage⁶. The hypothesis of this study is a more comprehensive clinicopathological assessment and correlation of IPCs with various serological and clinical parameter for the better management of patients.

In this study, the incidence of IPC was analysed in patients who underwent TURP for BPH and any significant association with respect to age, resected specimen volume and PSA level between BPH and IPC groups were investigated.

METHODS

Patient selection

A retrospective study was performed on 223 cases who underwent transurethral resection of prostate (TURP) for BPH treatment between January 2018 to December 2021 at Histopathology Dept, IGIMS, Patna a tertiary care institution. **INCLUSION CRITERIA-**

All TURP specimens, with no clinical suspicion of malignancy (either on direct rectal examination (DRE) and imaging techniques), recieved in pathology department.

EXCLUSION CRITERIA

All known cases of prostatic carcinoma (either on biopsy or raised PSA level).

Data Collection

Demographic data, preoperative serum PSA levels of the cases were collected from the hospital medical records and patient files. Histopathological findings and volume of the processed specimen were obtained from the records available at dept of pathology . The tissue slides in the histopathology department were retrieved and re-evaluated in patients where the pathology record did not include sufficient data.

Specimen Handling and Evaluation:

All the volume of TURP specimens were taken in cc. The method recommended in The College Of American Pathologists Guidelines was used for taking sample from specimens. Patients age, religion, pre-operative serum PSA level of the patients were assessed. In the IPC group, tumour stage, Gleason grade and score were evaluated .

Ethics approval and consent to participate

This study was reviewed and approved by the Ethics Committee, IGIMS , Patna(approval number:560/Acad., dated:23/06/2016).tThis was a retrospective study, so Consent of participant was not exercisable.

Statistical Analysis:

Data obtained in the study were statistically analysed using Epi-Info version software. Data were prepared in the form of descriptive statistics, as number(n) and percentage(%), and mean, standard deviation(SD) and range (min-max) values. For analytical study, parametric(student t test) and non-parametric (Mann-Whitney test) used to analyse the continuous data. A value of $p < 0.05$ was considered statistically significant.

Results:

The study included 223 patients. Prostate cancer was determined incidentally in 6 of 223 patients(2.7%) patients. BPH was observed in the remaining 121 cases(54.3%). BPH with Chronic prostatitis was detected in 80 cases (35.9%), BPH with High Grade PIN was detected in 7 cases (3.1%), BPH with Low Grade PIN was detected in 5 cases (2.2%) and atypical small acinar proliferation was detected in 4 cases (1.8%) (Table 4). Among 223 patients, most of the patients were in age group between 61-70yrs and less number of patients were in age group <50yrs (Table 1). 86% patients belong to one religion group and 13.9% belongs to other (Table 2). Volume <5cc were present in 38.1% and 61.9% patient presented with volume >5cc (Table 3).

The incidental prostate cancer was of higher mean age group and significantly higher PSA level ($p=0.516$, $p=0.001$, respectively) compared to the BPH group. There was statistical significant association ($p=0.025$) between IPCs and higher mean specimen volume (>5cc). (Table 5).

Frequency Table

Demographic presentation of Age (Table 1), Religion(Table 2), Volume(Table 3)

Age(Table 1)

	Frequency	Percent	Valid Percent	Cumulative Percent
Valid <= 50	20	9.0	9.0	9.0
51 - 60	58	26.0	26.0	35.0
61 - 70	98	43.9	43.9	78.9
70 >	47	21.1	21.1	100.0
Total	223	100.0	100.0	

Religion(Table 2)

	Frequency	Percent	Valid Percent	Cumulative Percent
Valid Hindu	192	86.1	86.1	86.1
Muslim	31	13.9	13.9	100.0
Total	223	100.0	100.0	

Volume(Table 3)

	Frequency	Percent	Valid Percent	Cumulative Percent
Valid <= 5 CC	85	38.1	38.1	38.1
> 5 CC	138	61.9	61.9	100.0
Total	223	100.0	100.0	

Histomorphological-Diagnosis(Table 4)

	Frequency	Percent	Valid Percent	Cumulative Percent
Valid ACINAR ADENOCARCINOMA	6	2.7	2.7	2.7
ATYPICAL SMALL ACINAR PROLIFERATION= ASAP	4	1.8	1.8	4.5

BPH	121	54.3	54.3	58.7
BPH WITH CHR PROST.	80	35.9	35.9	94.6
BPH WITH FOCAL HIGH GRADE PIN	7	3.1	3.1	97.8
BPH WITH LOW GRADE PIN	5	2.2	2.2	100.0
Total	223	100.0	100.0	

Patient characteristics in the IPC and BPH group (Table 5)

Variables	IPC group (n:6) Mean+_SD (Range)	BPH group (n:217) Mean+_SD (Range)	Total (n:223) Mean+_SD (Range)	P value
Age	66.67+_10.95 (52-80)	64.06+_9.67 (20-88)	64.13+_9.69 (20-88)	0.516
Volume	4.58+_2.58 (0.30-110)	8.11+_5.47 (0.30-25)	7.21+_12.72 (0.30-25)	0.025
PSA	80.17+_19.17 (0.50-7.00)	5.19+_2.44 (1-18)	8.06+_5.47 (1-110)	0.001

DISCUSSION:

TURP surgery is the treatment of choice for BPH and rarely, prostatic carcinoma can be detected incidentally. In this study, total 223 slides were studied and re-evaluated retrospectively to determine the incidence of incidental prostate cancer in patients undergoing TURP for BPH management and their demographic data were assessed with respect to age, PSA level and volume. A comparison was also made with variables like age, volume and PSA between IPC and BPH group for finding any significance of association. The study results determined the IPC incidence to be 2.7% and a significant difference was observed when volume and PSA level of IPC and BPH group were compared.

Serum PSA level, DRE and imaging techniques are supplementary methods used for prostate cancer diagnosis, but among them, PSA level is considered a better predictor of cancer than other methods⁷.

Although raised PSA is not specific for prostatic carcinoma and may also be mildly elevated in conditions like BPH, prostatitis and mechanical manipulation⁹. Prior to PSA era, detection rate of incidental prostatic carcinoma is up to 27%, but this rate has dramatically decreased with the widespread use of PSA screening¹³.

Several studies have compared incidental prostatic carcinoma incidence between pre-PSA to PSA era. Tombal et al. reported a decreased incidence of incidental prostate cancer from 27%

to 9% when compared pre-PSA to PSA era detection rates in over 1600 patients¹². More recently, in a study done by Jones et al. found a decrease in incidental prostate cancer from 14.9% to 5.2% in over 700 patients¹³. Decreased use of TURP surgery and increased use of medical and ablative therapy for BPH treatment, which do not always provide tissue for pathological analysis⁶. It could be another reason for decrease in incidental prostatic carcinoma incidence.

In several current studies, the incidence of IPC has been reported to vary between 1.4 to 16.7%^{5,6}. The IPC incidence rate in our study is seen to be consistent with the previous data reported.

Sakamoto et al.⁸ reported that higher mean age and PSA level were independent risk factors in patients for determination of IPC in case of TURP specimen. Nafie et al.¹⁰ showed a significant difference between IPC and BPH groups with respect to mean age and mean PSA level. Morita et al.¹¹ found a significant difference between IPC and BPH groups with respect to mean age, but unlike Nafie et al. study¹⁰, there was no significant difference in mean PSA levels.

In current study, a statistically significant difference is determined between IPC and BPH groups with respect to volume and PSA level ($p=0.025$, $p=0.001$, respectively), and is consistent with the reports of Morita et al.¹¹, but unlike the study by Nafie et al.¹⁰ there was no significant difference in age group ($p=0.516$).

The main focus of our study was to determine the incidence and the risk factors for prostatic carcinoma diagnosed incidentally in TURP specimen. In addition, relationship with various clinical and demographic parameters were evaluated and analysed. There were some limitations to this study. As data related to the postoperative follow-up were not available in all patients, hence treatment and prognosis could not be evaluated.

CONCLUSION:

The result of this study showed a 2.7% incidence rate of IPC in TURP. Volume of TURP specimen and PSA level were observed to be significant elements influencing IPC incidence but no statistically significant association is determined with the age group.

According to the current study results, it can be concluded that there is high probability of detecting IPC in cases with TURP specimen's volume $>5\text{cc}$ and/or in cases with PSA level $>5\text{ng/ml}$. It is suggested that sufficient material should be sampled and carefully evaluated, and all the resected specimen should be examined. Therefore, we suggest that further extensive studies should be conducted including the clinical and demographic data of patients, follow-up, treatment and prognosis, so that we could be able to reach at more definitive results.

REFERENCES:

1. DonduNergiz, HulyaTosun Yildirim &Senay Yildirim, (2021)incidence of incidental cancer in transurethral resection of prostate specimen:a 10-year retrospective analysis.African J of Urology 27:120
2. Bray F, Ferlay J, Soerjomataram I, Siegel RL, Torre LA, Jemal A (2018) Global cancer statistics 2018: GLOBOCAN estimates of incidence and mortality worldwide for 36 cancers in 185 countries. CA Cancer J Clin 68:394–424

3. Trpkov K, Thompson J, Kulaga A, Yilmaz A (2008) How much tissue sampling is required when unsuspected minimal prostate carcinoma is identified on transurethral resection? *Arch Pathol Lab Med* 132:1313–1316
4. Rajab R, Fisher G, Kattan MW, Foster CS, Møller H, Oliver T et al (2011) Transatlantic Prostate Group. An improved prognostic model for stage T1a and T1b prostate cancer by assessments of cancer extent. *Mod Pathol* 24:58–63
5. Perera M, Lawrentschuk N, Perera N, Bolton D, Clouston D (2015) Incidental prostate cancer in transurethral resection of prostate specimens in men aged up to 65 years. *Prostate Int* 4(1):11–14
6. Ozbey C, Oztorun K (2019) Frequency of incidental cancer in transurethral prostate resection materials and our clinical approach to these patients; a retrospective file scan. *Kafkas J Med* 9:11–16
7. X. Yu, S. P. Elliott, T. J. Wilt, and A. M. McBean, “Practice patterns in benign prostatic hyperplasia surgical therapy: the dramatic increase in minimally invasive technologies,” *Journal of Urology*, vol. 180, no. 1, pp. 241–245, 2008
8. Varghese J, Kuruvilla PM, Mehta N, Rathore RS, Babu M, Bansal D et al (2016) Incidentally detected adenocarcinoma prostate in transurethral resection of prostate specimens: a hospital based study from India. *Asian Pac J Cancer Prev* 17:2255–22
9. Sakamoto H, Matsumoto K, Hayakawa N, Maeda T, Sato A, Ninomiya A et al (2014) Preoperative parameters to predict incidental (T1a and T1b) prostate cancer. *Can Urol Assoc J* 8:E815–E820
10. Humphrey PA, Moch H, Cubilla AL, Ulbright TM, Reuter VE (2016) The 2016 WHO classification of tumours of the urinary system and male genital organs—part B: prostate and bladder tumours. *Eur Urol* 70:106–119
11. Nafie S, Dormer J, Khan MA (2017) The significance of histological analysis following laser transurethral resection of the prostate. *Int Urol Nephrol* 49:1343–1346
12. Morita M, Matsuura T (2012) An advanced but traditional technique of transurethral resection of the prostate in order not to overlook stage T1 prostate cancer. *CurrUrol* 6:21–26
13. B. Tombal, L. de Visccher, J. P. Cosyns et al., “Assessing the risk of unsuspected prostate cancer in patients with benign prostatic hypertrophy: a 13-year retrospective study of the incidence and natural history of T1a-T1b prostate cancers,” *BJU International*, vol. 84, no. 9, pp. 1015–1020, 1999.

Abbreviations:

PSA: Prostate specific Antigen
TURP: Transurethral resection of the prostate
BPH: Benign prostatic hyperplasia
IPC: Incidental prostate cancer
DRE: Digital Rectal Examination

Acknowledgements:

The authors thank Dr for his valuable support in statistical analysis of the data.

Author's Contributions:

All authors contributed to the development of this work. All authors read and approved the manuscript.

Funding:

This study has received no financial support and sponsorship.

Competing interests:

The authors declare that they have no competing interests.