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Original Research Article

Clinico-Etiological Profile of Urinary Bladder Carcinoma in Patients Presenting to Tertiary Care Hospital

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Abstract

Aim: The aim of the present study was to find out common causes of urinary bladder carcinoma in patients presenting to tertiary care centre.

Methods: The present study was conducted in the Department of General Surgery, Himalayan Institute of Medical Sciences, Dehradun, India on all newly diagnosed bladder cancer patients for the period of six months. There were 200 patients included in the present study.

Results: The average age at which carcinoma of the urinary bladder is often diagnosed is 56.34 years, with a range of 30 to 89 years. The largest proportion of individuals with this condition falls within the age range of 60 to 69 years, accounting for 24% of cases, followed by the age range of 30 to 39 years, which accounts for 21% of cases. In our research, it was observed that a majority of the patients (93%) diagnosed with urinary bladder cancer did not have a history of smoking. The historical documentation of urinary tract infections (UTIs) was found to be present in a mere 25% of individuals diagnosed with cancer of the urinary bladder. The Sikh population had the highest incidence of urinary bladder cancer, followed by the Hindu population. Farmers were found to have the highest number of patients with carcinoma urinary bladder, followed by labourers. Among the labourers, the majority were employees in industries related to dye, chemical, and fertilizer. In the subgroup of female patients, housewives constituted a significant proportion. The A+ blood group had the highest prevalence of carcinoma urinary bladder patients, followed by the B+ blood group, while the O- blood group had the lowest number of patients.

Conclusion: It was shown that a significant proportion of the patients had a lack of smoking behavior and possessed blood type A positive, which stands in contrast to the notable association between smoking and bladder cancer.

Keywords: Carcinoma bladder, Etiology, Non-smoker.

Introduction

Urinary bladder diseases encompass a wide range of conditions, comprising both non-neoplastic and neoplastic lesions, which are prevalent in occurrence. Urothelial tumors account for about 90% of the total incidence of bladder tumors. Urinary bladder cancer is a prevalent neoplasm affecting the urinary system, resulting in substantial global morbidity and death. [1] The prevalence of urinary bladder cancer constitutes approximately 3.2% of all cancer cases globally, with a significantly higher incidence observed in males compared to females, with a worldwide ratio of approximately 3.5:1. The majority of instances of urothelial carcinoma of the bladder are observed in individuals aged 50 years and above, although occurrences in younger adults and children are also possible. [2] Advancements in the field of early detection have rendered reproducible grading and staging as crucial factors in clinical management and prognosis.

Urothelial carcinoma, a kind of cancer affecting the urinary bladder, ranks as the fourth most prevalent cancer among men and the eighth most prevalent malignancy among women in the Western world. [3] According to current estimates from the National Cancer Registry Programme in India, the urinary bladder cancer has an overall incidence rate

of 2.25% per 100,000 individuals yearly. Among men, the incidence rate is 3.67%, while among females it is 0.83%. [4] Bladder cancer is associated with several risk factors. The use of tobacco, which leads to the excretion of α-naphthalene and β-naphthalene in urine, is a significant risk factor. [5] The classification (staging or grading) of bladder malignancies is determined based on the extent of invasion into the bladder wall. Superficial bladder cancer is confined to the mucosa and lamina propria, which are the deepest layers of the bladder. Bladder cancer of an invasive kind is characterized by the infiltration of the muscle layer into the wall of the bladder. The vast majority of cellular malignancies affecting the walls exhibit invasive characteristics. The majority of urothelial cell carcinomas have a non-invasive nature. The majority of instances of UBC, over 90%, manifest in individuals aged 55 and above, while half of the cases are seen in those aged 73 and above. In 2009, Ploeg et al. [6] documented that a population exceeding 2.7 million individuals had a prior record of urothelial bladder cancer (UBC), with an additional 12 million new cases emerging globally in 2003. [7] Out of the total, 5.4 million incidents took place in industrialized nations, while 6.7 million incidents happened in developing nations. [6,8] The University of British Columbia (UBC) is ranked as the ninth institution globally in terms of cancer incidence. In the male population, it ranks as the seventh most prevalent kind of malignancy, while in the female population, it is ranked seventeenth in terms of frequency. The number 6. In the year 2008, there were about 386,300 newly diagnosed cases of bladder cancer and 150,200 reported fatalities attributed to this disease on a global scale. [9]

Bladder carcinoma represents a type of cancer which has many causes which are preventable and which vary in different parts of the world. It also presents with symptoms early on (hematuria) and if detected early on has a good prognosis. Many studies have been done on its etiology the world over which further show that different regions have a different etiological profile.

The aim of the present study was to find out common causes of urinary bladder carcinoma in patients presenting to tertiary care centre.

Methods

The present study was conducted in the Department of General Surgery, Himalayan Institute of Medical Sciences, Dehradun, India on all newly diagnosed bladder cancer patients for the period of six months . There were 200 patients included in the present study.

Inclusion Criteria: All patients with a diagnosis of bladder cancer presenting during the study period were included in the study.

Exclusion Criteria: Patients unwilling or unable to give consent were excluded from the study.

All newly diagnosed patients with urinary bladder carcinoma for six months were included for their etiological analysis. Clinical details including history of hematuria, smoking, daily fluid intake, dietary history, symptoms of urinary tract infection (UTI), loss of weight/appetite, past medical history and blood tests including hemogram, renal function tests, liver function tests, imaging like ultrasonography of kidney, ureter, urinary bladder (USG KUB), contrast enhanced computed tomography of kidney, ureter, urinary bladder (CECT KUB) (if needed) and chest X-ray (CXR) was done in all the patients as per the standard protocol in the department of surgery. In addition, blood grouping of every patient was done and recorded. All patients underwent treatment in the form of transurethral resection of bladder tumor as per the standard protocol in the department.

Results

Table 1: Age distribution

Age (years)	Number	Percentage
30-39	42	21
40-49	28	14
50-59	32	16
60-69	48	24
70-79	40	20
80-89	10	5
Total	200	100
Mean±SD	56.34±16.32	

The mean age of presentation of carcinoma urinary bladder was 56.34 years (30-89 years) with the maximum number of patients being in the age group of 60-69 years (24%) followed by 30-39 years (21%).

Table 2: Smoking history, Distribution according to UTI history and Religion wise distribution

Smoker/non-smoker	Number	Percentage
Non-smoker	186	93
Smoker	14	7
UTI history		
Absent	150	75
Present	50	25
Religion		
Christian	8	4
Hindu	40	20
Muslim	6	3
Sikh	146	73

93% of the patients of carcinoma urinary bladder in our study were non-smokers. The history of UTI was present in only 25% of the patients of carcinoma urinary bladder. The maximum number of patients of carcinoma urinary bladder was Sikhs followed by Hindus.

Table 3: Distribution according to occupation and blood group

Occupation	Number	Percentage
Businessman (owner)	10	5
Farmer	124	62
Housewife	20	10
Labourer	30	15
Others	16	8
Blood group		
A+	70	35
A-	6	3
AB+	14	7
B+	54	27
B-	4	2
O+	50	25
O-	2	1

The maximum number of patients of carcinoma urinary bladder was farmers by occupation followed by labourers (mainly workers of dye, chemical, fertilizer industry and housewife in females' subset). The maximum number of patients of carcinoma urinary bladder belonged to A+ blood group followed by B+ and the least number of patients belonged to O- blood group.

Discussion

Bladder cancer is associated with several risk factors. The use of tobacco, which results in the excretion of α-naphthalene and β-naphthalene compounds in urine, is a significant factor contributing to risk.[4] Occupational exposure to aromatic amines, namely 2-naphthylamine, 4-aminobiphenyl, benzidine, and 4,4'-methylenebis (2-chloroaniline), poses an additional risk factor for the development of bladder cancer. These substances are commonly present in various products within the chemical, dye, and rubber industries, as well as in hair dyes, paints, fungicides, cigarette smoke, plastics, metals, motor vehicle exhaust, drinking water contaminants, and phenacetin-containing analgesics. [10]

The average age at which carcinoma of the urinary bladder is often diagnosed is 56.34 years, with a range of 30 to 89 years. The largest proportion of patients falls within the age range of 60 to 69 years, accounting for 24% of cases, followed by the age range of 30 to 39 years, which accounts for 21% of cases. In our research, it was observed that a majority of the patients (93%) diagnosed with urinary bladder cancer did not have a history of smoking. The historical documentation of urinary tract infections (UTIs) was found to be present in a mere 25% of individuals diagnosed with cancer of the urinary bladder. The Sikh population had the highest incidence of urinary bladder cancer, followed by the Hindu population. Cigarette smoking is well recognized as the primary risk factor for bladder cancer at the population level. However, it is crucial to acknowledge that other variables also contribute to the modification of the risk associated with smoking. The prevalence of tobacco smoking is seen in 78.9% of men and 25% of females within the studied population. The variation in outcomes is contingent upon the quantity and length of time, as shown by global observations. [11] The susceptibility to bladder cancer generated by smoking may be influenced by exogenous factors, such as the consumption of

vitamins C and E. The prevalence of familial bladder cancer is rather uncommon when compared to the family incidence of cancer in several other tumor locations. There is a substantial body of case reports that document the occurrence of family clustering of urothelial carcinoma, as well as its manifestation at an early age, which strongly implies the presence of a genetic factor.

A study was conducted by Sharma et al carried out in urinary bladder cancer (UBC) subjects and healthy control subjects with an aim to determine the role of GST and GSTT1 polymorphism and its implication on the organophosphate compounds (OPC) detoxification or bioaccumulation which may increase the risk of UBC in humans. [12] This study was also designed to identify the "gene-environment interaction" specifically between gene polymorphism in xenobiotic metabolizing genetic enzyme (s) and blood OPC levels. The results demonstrated a significant increase in frequency of glutathione S- transferase GSTM1/GSTT1 (null) genotype in UBC cases without interfering the distribution of other GSTT1/GSTM1 genotypes. Findings indicate that "gene- environment interaction" may play a key role in increasing the risk for UBC in individuals who are genetically more susceptible due to presence of GSTM1/GSTT1 null deletion during their routine encounter with or exposure to OPCs. A study in Costa Rica finds heavy pesticide use in rural counties is associated with an increased risk for bladder cancer in males (OR 1.71). [13]

The maximum number of patients of carcinoma urinary bladder was farmers by occupation followed by labourers (mainly workers of dye, chemical, fertilizer industry and housewife in females' subset). The maximum number of patients of carcinoma urinary bladder belonged to A+ blood group followed by B+ and the least number of patients belonged to O- blood group. Genes for ABO blood group antigens are located on chromosome 9q34. [14] This area of chromosome 9 has been seen to be frequently affected by gene deletions in carcinoma urinary bladder. It has been seen that these deletions might lead to loss of ABO antigen expression in about 25% of the cases. [15] It has been hypothesized that loss of ABO antigen expression may cause resistance to immune mediated apoptosis, altered adhesion /aggregation. Moreover, single nucleotide polymorphisms of the ABO gene are associated with increased plasma levels of soluble ICAM-1 and TNF, leading to altered immune response and possibly cancer growth. In the study by Chihara et al loss of heterozygosity of ABO gene or hypermethylation in the promoter region of the ABO gene showed significant reduction of A antigen expression in UBC, while the expression of the A antigen is maintained in concomitant dysplasia or normal urothelium, suggesting that loss of the ABO gene and/or its promoter hypermethylation is a specific marker for TCC. [16]

Conclusion

It was shown that a significant proportion of the patients exhibited non-smoking behavior and had blood type A positive, which contrasts with the commonly observed association between smoking and bladder cancer. The comprehensive understanding of the authentic natural history of bladder cancer remains incomplete. Extensive endeavors have been undertaken to investigate epidemiological risk variables and facilitate accurate diagnosis. The research proposes the inclusion of epidemiological surveys in the assessment of bladder cancer in order to develop effective disease control programs. Nevertheless, it is essential to conduct extensive and well planned prospective multicentre investigations in order to establish a standardized strategy.

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