

Bladder Cancer

(Disease prevalence)



WHITE PAPER

Bladder Cancer

1.0 Introduction

Urinary bladder is balloon-like organ that collects and stores urine before urination. The several types of malignant growths of urinary bladder are referred as Bladder cancer, in which abnormal cells multiply without control in the bladder. The wall of the bladder is composed of several different layers which include Epithelium, Lamina propria, Muscularis propria, and Perivesicle soft tissue. The cancer may affect mostly epithelium and perivesicle tissue. There are different types of bladder cancers which are distinguished based on the appearance (morphology). The cancer which affects the transitional epithelium cells that lines the wall of the bladder is called Urothelial cancer, squamous cell carcinoma is most commonly associated with chronic irritation of bladder by long term indwelling bladder catheters or by bladder calculi (stones), This type of cancer represents only 4% of all bladder cancers. The other rare cancers of bladder are adenocarcinoma, small cell carcinoma and muscle invasive bladder cancer, this cancer affects the deeper layer of muscle cells that forms the wall of bladder, which carries a higher risk of spreading beyond the bladder. [1]

Bladder cancers are classified based on their aggressiveness and the degree that they are different from the surrounding bladder tissue. Recently, the TNM staging system has become common. Stage 0 -- Non-invasive tumors limited to the bladder lining Stage I -- Tumor extends through the lining, but does not extend into the muscle layer Stage II -- Tumor invades the muscle layer Stage III -- Tumor extends past the muscle layer into tissue surrounding the bladder. Stage IV -- Cancer has spread to regional lymph nodes or to distant sites (metastatic disease)

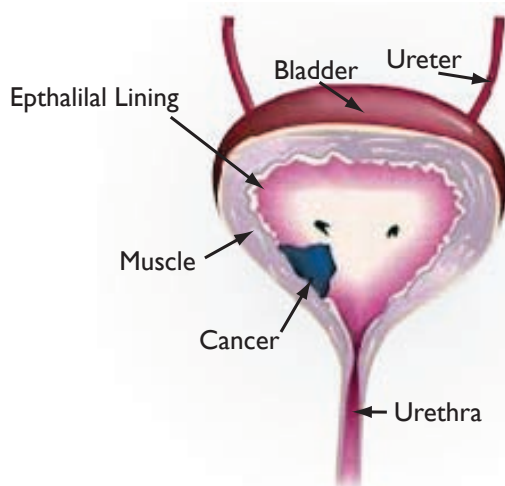


Fig 1: Urinary Bladder with cancer [3]

2.0 Signs and symptoms

In the early stages the bladder cancer is asymptomatic and difficult to detect. The most common symptom of bladder cancer is blood in urine which is noticed during urination by naked eye (gross hematuria) and some times visible only during laboratory analysis (microscopic hematuria). Other symptoms include Pelvic pain, Urination pain, Burning sensation during urination, Frequent urination, A feeling of incomplete bladder emptying and Feeling the need to urinate but unable to do so. However these symptoms can be caused by other medical conditions like urinary tract infections, kidney disease, kidney or bladder stones, prostate problems [2]

3.0 Causes and Risk Factors

Bladder cancer is more common in men than women. Bladder cancer usually takes a long time to develop and is most common in older people. It is rare in people under 40. The main risk factors for bladder cancer are smoking and exposure to chemicals at work. Tobacco use is the most important cause of bladder cancer, accounting for an estimated 40-70% of all cases. Bladder cancer risk is 2-3 times higher in smokers compared to non smokers. Number of carcinogens which can be filtered in high concentration in the urine and in time, damage the bladder's inner lining and develops the cancer [8]. About 50 percent of all bladder cancers in men and 30 percent of all bladder cancer in women are caused by cigarettes smoking. This risk gradually declines when the person quits smoking. Approximately one in four cases of bladder cancer can be attributed to chemical exposure in the work environment. The most dangerous chemicals are Arylamines used in the manufacture of rubbers, dyes, leather, textiles, and paint products. Polyromantic hydrocarbons (PAHs) used in industries that deal with pesticides, carbon, crude oil, or substances made from them. Other risk factors parasitic bladder infections such as bilharzia increase the risk of bladder cancer in many developing countries [5][6][8]. The factors which cause the Urothelial Bladder cancer are tabulated in the figure 2.

	Sufficient Evidence	Limited Evidence	Inadequate Evidence
Lifestyle			
Tobacco	x		
Alcohol			x
Coffee		x (high dose)	
Artificial Sweetners			x
Fluid intake			x
Diet		x (fruits/vegetables)	
Arsenic	x		
<i>Aristolochia fangchi</i>	x		
Balkan Nephropathy	x		
Infection/inflammation			
Schistosomiasis			
Recurrent infection	x (severe/stones)		x (mild/moderate)
Human papillomavirus			x
Latrogenic			
Phenacetin	x		
Acetaminophen			x
Cyclophosphamide	x		
Pelvic radiotherapy		x	
Laxatives			x
Host factors			
Glutathione-S-transferase	x		
Acetylation	x		
Cytochrome P-450			x
Occupational			
2-Napthylamine	x		
4-Aminobiphenyle	x		
Berzidine	x		
Berzidine-related azo dyes	x		
4,4-Methylenebis	x		
4-Chloro-o-toluidine	x		
O-toluidine	x		
Methylenedianiline			
Perchloroethylene		x	
Hair dyes			x
Automobile	x		
Coal gasification		x	

Fig 2: Risk factors for Urothelial Bladder cancer [4]

4.0 Incidence and Prevalence

The highest incidence rate of bladder cancer occurs in industrialized countries such as the United States, Canada, and France. The lowest incidence rate is in Asia and South America, where it is about 70% lower than in the United States. Incidence of bladder cancer increases with age. People above age of 70 develop the disease 2 to 3 times than those aged 55–69 and 15 to 20 times than those aged 30–54. Bladder cancer is 2 to 3 times more common in men. In the United States, about 38,000 men and 15,000 women are diagnosed with the disease each year. Bladder cancer is the fourth most common type of cancer in men and the eighth most common type in women. The disease is more prevalent in Caucasians than in African Americans and Hispanics.^[7] In Asia the high incidence rate is seen among Chinese in Hongkong of both sexes twice as high as that among the Chinese in shanghai or Singapore. Bladder cancer rates among the Chinese in Hawaii are also high.^[13] Incidence rates are low in Indian men, varying from 2.6 to 4.8 per 100,000 in urban areas^[9]

Continent		Male		Female	
		Country	Rate	Country	Rate
Africa	Highest	France, La Reunion	12.0	Zimbabwe, Harare	8.3
	Median	Algeria	10.7	Algeria	2.3
	Median	Zimbabwe, Harare	8.3	France, La Reunion	1.3
	Lowest	The Gambia	1.3	The Gambia	0.5
South America	Highest	Uruguay, Montevideo	22.6	Uruguay, Montevideo	4.3
	Median	United States, Puerto Rico	9.8	Brazil, Goiania	2.7
	Lowest	France, Martinique	3.6	Ecuador, Quito	1.3
North America	Highest	United States, New Jersey, White	28.0	United States, Connecticut, White	8.0
	Median	United States, New Mexico, Non-Hispanic, White	19.4	United States, Louisiana, Central Region, White	5.2
	Median	United States, California, Los Angeles	19.0	United States, Louisiana, New Orleans	5.1
	Lowest	United States, New Mexico, American Indian	4.1	United States, New Mexico, American Indian	0.7
Asia	Highest	Israel, Jews born in Europe or United States	27.8	Israel, Jews born in Europe or United States	6.0
	Median	China, Beijing	5.9	Singapore	1.7
	Lowest	India, Trivendrum	2.0	India, Karunagappally	0.3
Europe	Highest	Belgium, Limburg	42.5	Scotland	8.1
	Median	England, South & Western Regions	23.9	Czech Republic	4.6
	Median	England, Merseyside and Chesire	23.7	France Doubs	4.5
	Lowest	Slovenia	11.1	Belarus	1.6
Australia	Highest	United States, Hawaii, White	23.9	Australia, South	6.2
	Median	United States, Hawaii	13.4	United States, Hawaii, Japanese	3.4
	Lowest	United States, Hawaii, Hawaiian	6.8	United States, Hawaii, Filipino	2.2
Total Brief	Highest	Belgium, Limburg	42.5	Zimbabwe, Harar	8.3
	Median	United States, Louisiana, Central Region	16.6	Spain, Navana	3.9
	Lowest	The Gambia	1.3	India, Karunagappally	0.3

*Rates are per 100,000 and are age standardized to the World Standard Million.

†Years vary slightly between countries

Source: Parkin DM, Whelan BL, Ferley J, Teppo L, editors, Cancer Incidence in five continents, volume VIII. IARC Scientific Publication No. 155 Lyon (France): International Agency for Research on Cancer, 2002

Fig: 3 Bladder cancer: Age-standardized incidence rates for highest, median, and lowest country with in continent by Sex

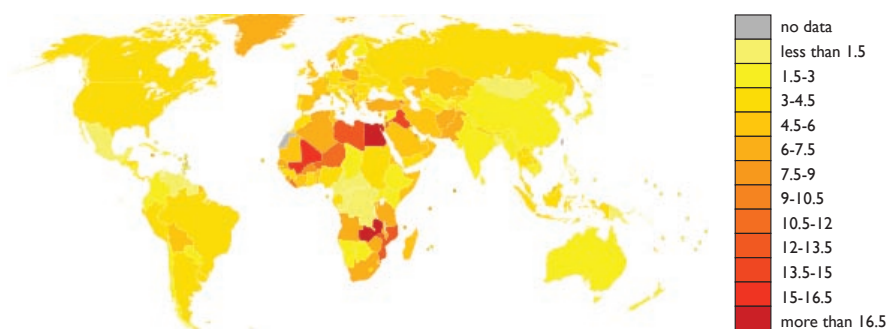
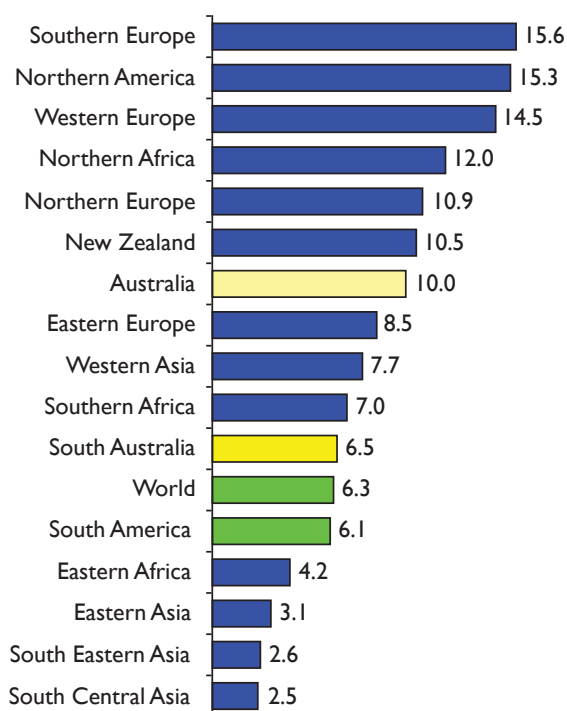


Fig: 4: Bladder_cancer_world_map-Death-WHO2004



(Rate/100,000 ASR World Pop., Globocan 2002)

Fig: 5 Bladder cancer incidence rate by region of the World [10]

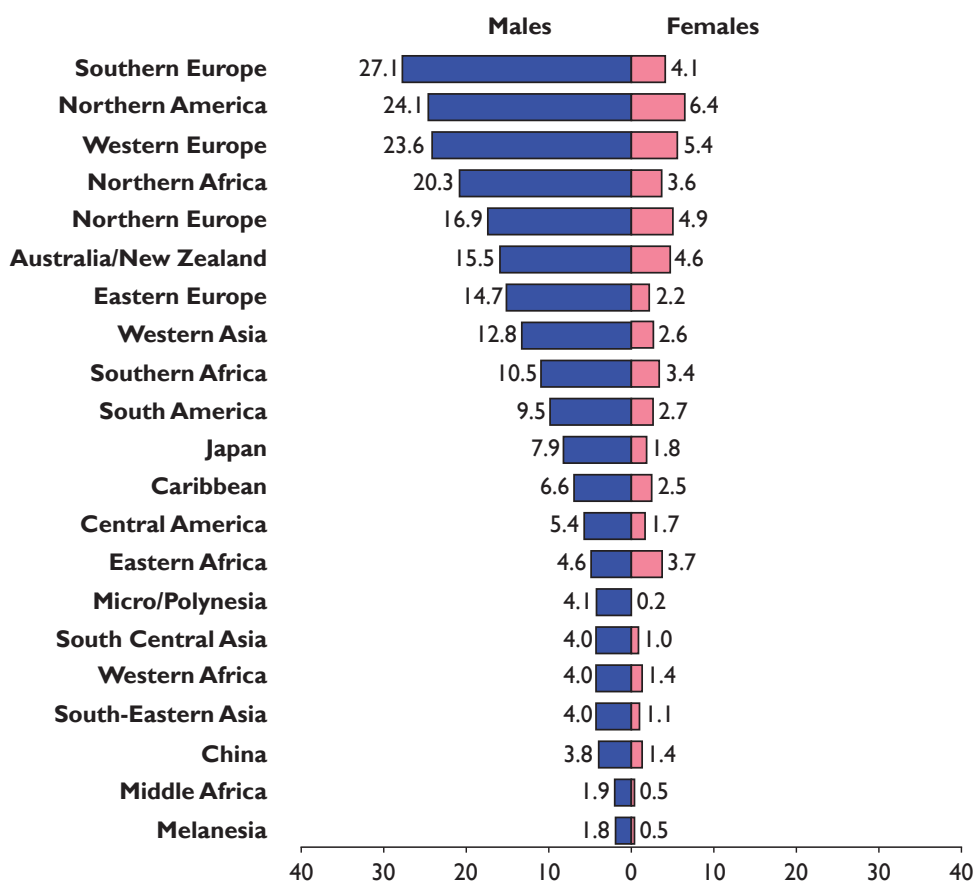


Fig 6: Age-standardized Incidence Rates for Bladder Cancer per 100,000

5.0 Treatment Options

Several types of treatments available for bladder cancer patients. Treatment varies from patient to patient and takes in consideration certain factors like the tumor type and size, the cancer stage, the cancer extent the general health state of the patient, and the patient's age. The treatment options for bladder cancer patients include: surgery, chemotherapy, biological therapy, radiation therapy, and photodynamic therapy. Surgery include five types of surgeries that can be performed in patients with bladder cancer like Transurethral Resection (TUR)

with fulguration, Segmental cystectomy Radical cystectomy, Bladder reconstruction surgery and Urostomy^[6]

6.0 Status of trials in Asia: ^[12]

Trial status	India	Indonesia	Philippines	Singapore	Thailand	Japan
Total	5	2	2	2	2	4
Recruiting	3	--	--	--	--	2
Completed	1	2	2	2	2	1
Active Not Recruiting	1	--	--	--	--	--
Terminated	0	--	--	--	--	1

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