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Risk of Prostrate Cancer in Eastern India

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ABSTRACT

A total of 3747 cases were assessed to understand the prostrate cancer profile in the population of West Bengal from 2003-2010. Present investigation revealed that prostate cancer rate was climbing with 5.71% incidence and the ignorance is partially responsible for that alarmingly high incidence in elder males particularly from 51-70 years age group. The level of PSA (Prostate Specific Antigen) in the blood was high (<4 ng mL^{-1}) in men having prostate cancer. The cancer frequency was moderate during 2003 to 2006, but it rises drastically from 2007 (17.76%) and reached maximum peak (28.97%) in 2010. Prostate cancer was most prevalent in group A, followed by group B and group O. The absolute number of new cancer cases was increasing rapidly, due to growth in size of the population and increase in the proportion of elderly persons as a result of improved life expectancy. The risk of developing prostate cancer was related to age, genetics, race, diet, lifestyle, medications and other factors. This peak cancer scenario can be altered in a positive direction by regular screening and by training the prevention measures of life style modification in a wide scale through proper way.

Key words: Prostate cancer, population based study, incidental risk, West Bengal

INTRODUCTION

Cancer of the prostate is now recognized as one of the principal medical problems facing the male population and more often affects elderly men (Aly, 2005; Tawfiek *et al.*, 2010). It is a bigger health concern in developed countries having 15% incidence among all male cancers, in contrast to developing countries in which 4% of male malignancies are prostate cancer (Parkin *et al.*, 2001). In most countries a slight increase in prostate cancer mortality has been seen since 1985 (Quinn and Babb, 2002). In the year 2005 there were an estimated 230,000 new cases of prostate cancer and 30,000 deaths due to prostate cancer in USA (IARC, 2001). Prostate cancer frequency is lower in India as compared to Western countries (Sinha *et al.*, 2003). The male sex hormone testosterone aids the growth of prostate cancer cells. Regional differences and racial predisposition are another factor; incidence of prostate cancer is highest in Blacks and lowest in Asians. Many factors, including genetics, environmental and dietary factors are involved in the development of prostate cancer (Avci *et al.*, 2005; Sinha *et al.*, 2003). In India the majority of cancer is diagnosed in the advanced stage and hence morbidity remains high. Beside this cancer mortality rates are under-reported due to poor recording of the cause of death. Incorporating screening, detection and treatment of diseases like cancers into peripheral health infrastructure has a significant effect on reducing mortality from these diseases (Johnson, 2006; Murthy and Mathew, 2004). The measurement of PSA, an organ-specific kallikrein-like serine protease produced almost exclusively

by the epithelial cells of the prostate, has revolutionized the diagnosis of prostate cancer (Polascik *et al.*, 1999; Stamatiou *et al.*, 2007). Keeping in view the paucity of reliable data in a country with wide socio-cultural diversity, the present investigation was aimed to study the prostate cancer incidence in a part of eastern India for the last eight years.

MATERIALS AND METHODS

A demographic study on 3747 male cancer cases were assessed for prostate carcinoma from the patients attending to Barasat Cancer Research and Welfare Centre, a prime health centre covering many districts of eastern India, for the period 2003 to 2010. The malignancy was diagnosed by symptoms, physical examination and various investigations like radio-imaging, cytology, histo-pathological examinations, PSA test or biopsy by physicians. The data of the prostate cancer staging, extent of metastasis, age, ABO blood grouping and patho-physiological status of the cancer patients were collected. Written informed consent was obtained from all in accordance with the guidelines from hospital center review board.

RESULTS

Among the entire 3747 cancer patients, 214 males (5.71%) showed prostate carcinoma. The level of PSA in the blood was high (<4 ng mL^{-1}) in men having prostate cancer (Table 1). In most cases it is slow-growing and symptom free. There was variation in the site-wise distribution within the population. In some region a certain types of cancers are pronounced in groups and seem to show one kind of association in them due to similar environmental status. This multiple neoplastic syndrome was common for cancers of prostate-lung-bone and others in this population.

The present investigation revealed that the cancer frequency was moderate during 2003 to 2006, but it rises drastically from 2007 (17.76%) and reached maximum peak (28.97%) in the last year (Table 2 and 3). Comparative analysis of prostate cancer in different age groups revealed that cancer frequency was common for age group 41 to 80 years and the frequency was alarmingly high particularly from 51-70 years (Table 2). The result also highlighted that men below 40 years of age never showed prostate cancer incidence. The frequency of prostate cancer was only 5.61% at age group 41-50 years. After that the frequency drastically increased and reached 30.37% for the age group 51-60 years and showed maximum peak at 61-70 years of age with 44.39% incidence. Further decline in incidence pattern was observed after 70 years of age among the men with 18.69% incidence at 71-80 years of age.

Table 1: Detection of prostate cancer by PSA test

Age (year)	PSA level (ng mL^{-1})	Prostate cancer	Age (year)	PSA level (ng mL^{-1})	Prostate cancer
61	0.48	-	68	44.33	+
45	0.65	-	74	182.15	+
60	2.88	-	75	18.00	+
59	1.52	-	72	18.14	+
56	2.07	-	71	19.41	+
30	0.77	-	60	46.39	+
75	1.17	-	67	11.91	+
66	5.75	+*	65	18.03	+
82	9.54	+*	72	18.75	+
45	0.53	-	62	120.80	+

*Border line: 4.01-10.01 ng mL^{-1}, +: Present -: Absent

Table 2: Distribution of prostate cancer in different age groups

| Year | Age group (years) | | | | | | Total |
	≤40	41-50	51-60	61-70	71-80	≥81	
2003					1 (100.00)		1 (0.47)
2004	-	-	-	1 (100.00)	-	-	1 (0.47)
2005	-	-	-	3 (60.00)	2 (40.00)	-	5 (2.34)
2006	-	-	-	2 (100.00)	-	-	2 (0.93)
2007	-	1 (2.63)	19 (50.00)	13 (34.21)	5 (13.16)	-	38 (17.76)
2008	-	4 (8.70)	14 (30.43)	21 (45.65)	7 (15.22)	-	46 (21.50)
2009	-	3 (5.08)	13 (22.03)	26 (44.07)	16 (27.12)	1 (1.69)	59 (27.57)
2010	-	4 (6.45)	19 (30.65)	29 (46.77)	9 (14.52)	1 (1.61)	62 (28.97)
Total	-	12 (5.61)	65 (30.37)	95 (44.39)	40 (18.69)	2 (0.93)	214

The digit in parenthesis represents the frequency value

Table 3: Distribution of prostate cancer in different blood groups

| Year | Blood group | | | | Total |
	A	B	AB	O	
2003	-	-	-	1 (100.00)	1 (0.47)
2004	1 (100.00)	-	-	-	1 (0.47)
2005	3 (60.00)	-	-	2 (40.00)	5 (2.34)
2006	2 (100.00)	-	-	-	2 (0.93)
2007	18 (47.37)	11 (28.95)	2 (5.26)	7 (18.42)	38 (17.76)
2008	16 (34.78)	14 (30.43)	7 (15.22)	9 (19.57)	46 (21.50)
2009	21 (35.59)	18 (30.51)	8 (13.56)	12 (20.34)	59 (27.57)
2010	20 (32.26)	19 (30.65)	11 (17.74)	12 (19.35)	62 (28.97)
Total	81 (37.85)	62 (28.97)	28 (13.08)	43 (20.09)	214

The digit in parenthesis represents the frequency value

Frequency distribution of prostate cancer in different blood groups showed that prostate cancer was most prevalent in group A (37.85%), followed by group B (28.97%) and group O (20.09%). The blood group AB was the least frequent class having only 13.08% cases of prostate cancer in the studied population (Table 3).

DISCUSSION

The demographic study highlighted that in the studied population among different types of malignant conditions the incidence of prostate carcinoma was threatening among males. This observation was in line with the early investigation that in this population the cancer of prostate forms a largest group for men (Chatterjee, 2011). Since it is hard to prove, the jury is still out on many of these, may be due to the environmental pollution, lifestyle and dietary toxicants which are vulnerable carcinogens causing cancers world wide (Kumar *et al.,* 2011; Mahajan *et al.,* 2009). The observation also supported the fact that prostate cancer tends to develop in men over the age of 50 and the average age at the time of diagnosis is 70 (Hankey *et al.,* 1999). The frequency was alarmingly high particularly from 51-70 years as similar to report facts of urinary bladder cancer (Ahmed *et al.,* 2006). This investigation was at per with the study that prostate carcinoma was

increasingly high in blood group A followed by group B, as was observed by early research (Chatterjee and Mukherjee, 2009).

The present study was concerned with malignancy of prostate, the incidence of which was increasing due to various factors of different activities. The ignorance is partially responsible for that prevalence. Evidence from epidemiological studies supports protective roles in reducing prostate cancer for dietary selenium, vitamin E, lycopene, soy foods and recommended lifestyle changes by lowered intake of animal fat and increased intake of fruit, cereals and vegetables in order to decrease the risk (Khorshid, 2009; Hafidh *et al.,* 2009; Schulman *et al.,* 2000). Daily use of anti-inflammatory medicines, cholesterol-lowering drugs may also decrease prostate cancer risk (Jacobs *et al.,* 2005; Shannon *et al.,* 2005). The risk of developing prostate cancer is related to age, genetics, race, diet, lifestyle, medications and other factors (Sinha *et al.,* 2003). The present study highlighted that the risk increased with age more rapidly than any other cancer. Men who had a history of prostate cancer in their family, especially a close relative such as father or brother, were at an increased risk. The absolute number of new cancer cases was increasing rapidly, due to growth in size of the population and increase in the proportion of elderly persons as a result of improved life expectancy following control of communicable diseases (Murthy and Mathew, 2004). Moreover, the proper treatment of malignant conditions is much costly and also not available properly at all places. Due to lack of necessary infrastructure and low literacy rates, the incidence is high in countries like India (Murthy and Mathew, 2004). Therefore, the early diagnosis and prevention of cases are of paramount importance to reduce the incidence of the malignant conditions in the society. Active surveillance is useful for suspect an early stage, slow-growing prostate cancer and also prevention for the risks of surgery, radiation therapy, or hormonal therapy. This prevalent cancer scenario can be altered in a positive direction by regular screening and by training the prevention measures of life style modification in a wide scale through proper way.

CONCLUSIONS

It can be concluded that in this population the cancer of prostate forms a largest group for men. Many factors, including genetics, environmental and dietary factors are involved in the development of prostate cancer. In India the majority of cancer is diagnosed in the advanced stage and hence morbidity remains high. Beside this cancer mortality rates are under-reported due to poor recording of the cause of death. Incorporating screening for cancers into peripheral health infrastructure has a significant effect on reducing mortality from these diseases. The present investigation gave a deep sight in this regard on the incidental risk of prostate cancer in eastern India.

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