

The Relationship of Age, Sex and Marital Status with the Prevalence of Cancer in the Patients Visiting Nishter Hospital, Multan, Pakistan

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Abstract.- On the basis of age and marital status data collected from Nishter Hospital Multan during the year 2000, cancers patients (n=1389) of both sexes (male = 691; female =698) were divided into seven age groups ranging from >2 to <10, >10 to <20 > 20 to >30 >30 to <40 <40 to <50, >50 to < 60 and > 60. These patients were found to have 89 different types of cancers, the most prevalence being breast cancer (14.2%) followed by lymphoma (10.2%) and liver cancer (5.4%). The prevalence of cancer was similar in male and female (male = $49.8 \pm 1.3\%$; female= $50.2 \pm 1.3\%$; $P > 0.05$). It was however, higher ($P < 0.001$) in married females (86 ± 1.31) than in unmarried females (14 ± 1.31). The prevalence of cancer was higher in age group of >60 years (26.0 ± 0.02) and it was less prevalent in age group of <10 (4.6%). It was found that the prevalence of cancer was significantly different in different age groups ($P < 0.001$).

Key words: Prevalence of cancer, Age, Genders, Marital Status, Multan.

INTRODUCTION

Cancer is an important public health concern around the world (Greenlee *et al.*, 2000). It is defined as uncontrolled cell division (American Cancer Society, 1990; Cooper, 1992). The elimination of infectious diseases resulted in increased average life span and corresponding this increased the non-infectious diseases (Cooper, 1992) like coronary heart disease and cancer (Clegg *et al.*, 1994). The word “cancer” is used for more than two hundred diseases that arise in any cell (Rosenbaum, 1983).

Overall rates of cancer incidence vary considerably among racial and ethnic groups. Blacks have the highest cancer incidence rates and have 60% more potential to develop cancer than Hispanics, Asian/Pacific Islanders and American Indians (Greenlee *et al.*, 2000). It has been reported that between 1990 and 1996, incidence rates decreased in Islanders (Ries *et al.*, 1997). Moreover, mortality rates decreased significantly among whites and Hispanics; remained stable in Asian / Pacific Islanders and increased in American Indians

(Greenlee *et al.*, 2000). Black women are more likely to die of breast, colon and rectum cancer than women of any other racial group (Ries *et al.*, 1997). Furthermore, black men have at least 50% more chances to develop prostate cancer than men of other ethnic groups (Greenlee *et al.*, 2000). Cancer can occur at all ages, but it is more common in adult age. In adults, the common cancer are of lung, breast, colon and rectum (Cooper, 1992). Although, cancer in childhood is very rare but cancer of blood, brain and lymphoma among children has been reported.

The literature survey indicated that work on the prevalence of cancer with respect to different parameter has not been carried out in Pakistan. The main objective of the present study was to determine prevalence of various types of cancers and their relationship with the age, sex and marital status of human population of Multan.

PATIENTS AND METHODS

The Ethical Committee of the Institute approved the protocol for the present study. This study was designed to investigate the prevalence of cancer in Multan and surrounding areas. For this study the data of 1389 patients (male=691;

female=698) diagnosed as cancer patient during the year 2000 was collected from Nishter Hospital, Multan. The validity of this data was confirmed by personal interviews of randomly selected individuals by obtaining information about their age, marital status and type of cancers. Ten most prevalent cancers in total sample as well as male and female patients were calculated. Data was divided into 7 age groups namely > 2 to < 10 (years), >10 to <20, >20 to <30, >30 < 40, >40 to <50, >50 <60 and >60. The data of the female patients was divided into two groups on the basis of marital status *i.e.* married (n=601), unmarried (n=97).

The results are mainly expressed as percentage \pm standard error (SE). The data was analyzed statistically by routine statistical tests for the calculation of percentage and SE. The comparison of different types of percentages obtained for various parameters were performed by Chi-square test and P values < 0.05 were considered statistically significant.

RESULTS

The results of the present study showed 89 different types of cancers with variable frequencies in this sample (data not shown). Table I represents the prevalence of ten most common cancers revealed during this study. These results showed that breast cancer (14.2%) was the most prevalent followed by lymphoma (10.2%), liver cancer (5.5%), leukaemia (5%), brain tumour (3.7%), oral cancer (3.7%), lung cancer (3.2%), bone tumour (3.2%), uterine cancer (3%) and cancer of gall bladder (3%). It was found that prevalence of these cancers were significantly different from each other ($P < 0.001$).

The results of present study indicated that males (49.8%) and females (51.2%) suffered equally from various types of cancers and the sexual status had no influence on the prevalence of different types of cancers in these patients (Table II). The ten most prevalent cancers and their frequencies found in male and female populations at Multan are shown in Tables III and IV, respectively. Lymphoma was found to be the most prevalent (14.61%) in males. It was followed by liver cancer (7.38%), leukaemia

(6.80%), brain tumour (5.78%), lung cancer (5%), colorectal (5%), oral cancer (4%), bone tumour (4.34%), soft tissue sarcoma (3.76%), prostate (2.60%) and testis cancer (2%).

Table I.- Ten most common cancers in patients visiting Nishter Hospital, Multan during the year 2002 (n=1389).

Type of cancer	Age (Mean \pm SD)	Percentage \pm SE
Breast cancer (n=198)	46.6 \pm 12.9	14.2 \pm 0.01
Lymphoma (n=143)	32.8 \pm 18.4	10.2 \pm 0.01
Liver cancer (n=76)	52.9 \pm 11.7	5.5 \pm 0.01
Leukemia (n=71)	32.2 \pm 16.3	5.0 \pm 0.01
Brain tumour (n=52)	23.8 \pm 8.4	3.7 \pm 0.01
Oral cancer (n=52)	51.2 \pm 10.3	3.7 \pm 0.01
Lung cancer (n=45)	53.4 \pm 13.8	3.2 \pm 0.01
Bone tumour (n=45)	38.9 \pm 20.9	3.2 \pm 0.01
Uterine cancer (n=44)	46.1 \pm 12.5	3.0 \pm 0.01
Gall bladder cancer (n=44)	54.6 \pm 10.3	3.0 \pm 0.01

$\chi^2 = 216.4$; DF = 9; $P < 0.001$

Table II.- Sex wise prevalence of cancer in patients visiting Nishter Hospital, Multan during the year 2002 (n=1389).

Sex	Age (Mean \pm SD)	Percentage \pm SE
Male (n=691)	43.2 \pm 17.4	49.8 \pm 1.3
Female (n=698)	40.6 \pm 16.8	50.2 \pm 1.3

$\chi^2 = 0.034$; DF = 1; $P > 0.05$

Table III.- Ten most common cancers in male patients visiting Nishter Hospital, Multan during the year 2002 (n=691).

Type of cancer	Age (Mean \pm SD)	Percentage \pm SE
Lymphoma (n=101)	35.4 \pm 19.4	14.61 \pm 0.003
Liver cancer (n=51)	53.3 \pm 11.7	7.38 \pm 0.003
Leukemia (n=47)	43.6 \pm 13.5	6.80 \pm 0.003
Brain tumour (n=40)	21.6 \pm 8.3	5.78 \pm 0.003
Oral cancer (n=27)	54.4 \pm 10.6	4.00 \pm 0.003
Lung cancer (n=34)	59.7 \pm 9.9	4.92 \pm 0.003
Colorectal cancer (n=34)	44.9 \pm 15.8	4.92 \pm 0.003
Bone tumour (n=30)	40.8 \pm 20.4	4.34 \pm 0.003
Sarcoma (n=26)	27.9 \pm 15.1	3.76 \pm 0.003
Prostate cancer (n=18)	63.4 \pm 11.2	2.60 \pm 0.003

$\chi^2 = 143.8$; DF = 9; $P < 0.001$

Table IV.- Ten most common cancers in female patients visiting Nishter Hospital, Multan during the year 2002 (n=698).

Type of cancer	Age (Mean±SD)	Percentage ± SE
Breast cancer (n=188)	44.9±12.6	27.0±0.002
Lymphoma (n=42)	28.0±15.5	6.0±0.002
Uterine cancer (n=44)	46.1±12.5	6.30±0.002
Ovary cancer (n=39)	35.4±18.3	5.58±0.002
Gall Bladder (n=36)	51.6±9.9	5.15±0.002
Oral cancer (n=25)	48.3±9.2	3.58±0.002
Liver cancer (n=25)	52.4±11.8	3.58±0.002
Leukemia (n=24)	41.4±10.4	3.43±0.002
Kidney cancer (n=15)	45.0±13.5	3.43±0.002
Bone tumour (n=15)	35.4±15.6	3.43±0.002

$\chi^2 = 524.6$; DF = 9; $P < 0.001$

In the females the most prevalent cancer was that of breast cancer (27%) followed by uterine cancer (6.30%), lymphoma (6.01%), ovary cancer (5.58%), cancer of gall bladder (5.15%), oral cancer (3.58%), liver cancer (3.58%), leukaemia (3.43%), kidney cancer (2.14%) and bone tumour (2.14%). It was found that prevalence of these different types of cancer were significantly different from each other both in the male as well as female.

Amongst females the prevalence of cancer was 86% in married women whereas it was 14% in the unmarried female group (Table V). The prevalence of cancer was significantly higher in married women compared with unmarried group ($\chi^2 = 363.8$; DF = 1; $P < 0.001$).

Table V.- The prevalence of cancer in relation to marital status in female patients visiting Nishter Hospital, Multan during the year 2002 (n=698).

Marital status	Age (Mean±SD)	Percentage ± SE
Married (n=601)	45.8±13.3	86±1.3
Unmarried (n=97)	19.6±8.7	14±1.31

$\chi^2 = 363.8$; DF = 1; $P < 0.001$

Table VI shows the effect of age on the distribution of various kinds of cancers recorded during present study. The maximum prevalence of cancer was found in the age group of >60 years (26%), whereas in age group 2-10 years, the

prevalence was 4.6%, with all gradations in between these two limits. Similar trend was observed, when data was analyzed sex wise. The prevalence of cancer was therefore higher in elderly patients, not only in total samples but also in the male and female patients. It was concluded that age of the patients and the prevalence of cancer had a direct relationship. Moreover, the prevalence of cancer was significantly different in different age groups.

Table VI.- Distribution of cancer with age in patients visiting Nishter Hospital, Multan during the year 2002

Age groups (Years)	No. (%) of patients in total sample (n=1389)	No. (%) of patients in male sample (n=691)	No. (%) of patients in female sample (n=698)
> 2 to < 10	65 (4.6)	39 (5.6)	26 (3.7)
> 10 to < 20	110 (8.0)	77 (11.0)	33 (4.7)
>20 to <30	131 (9.4)	76 (11.0)	55 (8.0)
>30 to <40	209 (15.0)	82 (11.8)	127 (18.2)
>40 to <50	248 (18.0)	92 (13.0)	156 (22.3)
>50 to <60	265 (19.0)	121 (17.6)	144 (20.6)
> 60	361 (26.0)	204 (30.0)	157 (22.5)

By comparing the data in male and female patients (Table VI), it could be revealed that although overall incidence of cancer in both groups (male/female) was higher in age group of >60 years but it was also found that male were at greater risk of developing cancer in older age (30%) as compared to females (22.5%).

DISCUSSION

In this study the breast cancer (14.2%) has been found to be the most prevalent and uterine cancer the least prevalent (3%). These results confirm the earlier reports of Javed (1998) who has reported that most prevalent cancers in human population of Multan are that of breast cancer followed by lymphoma. Moreover, the highest prevalence of breast cancer in this study is also in agreement with the work of Cooper (1992) who found that breast cancer is most common among women and accounts for 14% of cancer incidence in the United States.

The first risk of developing breast cancer in women is genetic background. The overall risk of developing breast cancer is increased two or three fold for those women whose mothers or sisters have had the disease (Willett, 1989). Use of birth control pills for several years prior to first pregnancy may results in a modest increase in breast cancer risk (National Cancer Institute, 1991; Page and Asire, 1985). The other risk factors for development of breast cancer are the effect of estrogens on the breast tissue (Case, 1984). The early menarche (before age of 12) or late menopause (after age 55) is associated with two-fold increase in breast cancer (Willett, 1989).

It has been suggested that in tropical countries like Pakistan the onset of menarche is earlier due to high temperature. The rate of increase in population is high in our society and higher number of repeated pregnancies could delay the menopause. Moreover, as estrogens levels during repeated pregnancies would be high, this may result in higher incidence of cancer. Another important factor may contribute to higher prevalence of cancer in this data is the physical inactivity of the women. It has been suggested that physical inactivity has been shown to be a risk factor for cancer, and in part accounts for the international differences in cancer rates (Willett, 2001). Increased use of fat containing diet during pregnancy is common in developing countries and this may increase the risk of developing breast cancer upto 50% in women (Henderson *et al.*, 1988).

The present study indicated that male (49.8%) and female (50.2%) were equally suffering from various types of cancers (Table II). Our findings regarding the sex wise prevalence of cancer supports the earlier work of Edwards and Bouchier (1991) who showed that cancer is as common in women as in men in United States.

The present study showed that lymphoma was the most prevalent cancer in male (Table III). These results confirm earlier work of Javed (1998). Furthermore, the results regarding maximum prevalence of lymphoma in male population is in complete agreement with the report of Edwards and Bouchier (1991) in United States.

The higher prevalence of cancer in married women (86%; Table V) confirms the earlier report

of Siddiqui (1998) who has found that incidence of cancer is high in the married population and low in unmarried population in America particularly in females. This could be due to the enhanced estrogens production by the ovaries during pregnancy (Henderson *et al.*, 1988). Another reason of lower prevalence of cancer in unmarried woman could be the lower age in this group.

According to many authors (American Cancer Society, 1990; Edwards and Bouchier, 1991; Jones, 1994; Greenlee *et al.*, 2001) cancers occurs in human population in middle age or above 40 years of age. By that time, most of the women are married in our society, so this may be the reason for the high prevalence of cancer in married females. The other cause of cancer is the change of lifestyle from 40 to 50 years of age in women (National Cancer Institute, 1991; Jones, 1994) and the absence of spouse (Hemminki and Li, 2003), which is quite common in Pakistan.

In the present study (Table VI), it was indicated that maximum prevalence of cancer was in the individuals who are >40 years of age. This findings supports the earlier reports (Bylinsky, 1976; Holwes and Hearne, 1981; Silverberg *et al.*, 1990; Edwards and Bouchier, 1991; Kennedy *et al.*, 1994; Bennet, 2001; Greenlee *et al.*, 2001), which have shown that cancer develops at all ages but becomes more frequent as we grow older. It was suggested that at old age with the declining immune capacity, cancerous cells, earlier eliminated by an effective immune system, are able to survive in the later years when lymphocytes may fail to recognize the cancerous cells as one self (Markinodon *et al.*, 1971; Bylinsky, 1976).

In this study, 30% prevalence of cancer in male aged >60 years (Table VI) confirmed the earlier work which has shown that increase of cancer in males is more marked after 50 years of age in America (Edwards and Bouchier, 1991; Miquel *et al.*, 1998; Robert *et al.*, 2001). It has been shown that colon cancer is found in males only in middle-aged persons (Strom *et al.*, 1995). Lymphoma and leukaemia, which are common in men, occur above 60 years of age (Edwards and Bouchier, 1991; Jones, 1994; Greenlee *et al.*, 2001).

In conclusion, the present study showed that the most prevalent cancer in female population was

that of breast whereas lymphoma was most frequent in male. Moreover, the prevalence of cancer and age had a direct relation and both male and female were equally suffering from cancer.

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