



## CANCER IN YOUNG AND OLD PATIENTS: A SINGLE CENTER OBSERVATIONAL STUDY

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### ABSTRACT

This study was intended to assess pattern of cancer among young and old population visiting a tertiary cancer treatment center.

**Material and methods:** A hospital based retrospective, observational, analytic study was conducted at a cancer care tertiary center in Western India during December 2016 to May 2017. Patients who had histologically proven malignancies (both newly diagnosed and previously diagnosed) and visited cancer OPD were included. Total 3068 patients attended cancer OPD during the study period, out of them 2085 (67.96%) patient were >40 years old (age range 41-91 years) with M:F ratio 4:3. The maximum patients (590, 19.2%) were in age group of 41-60 years. Ca lung was the most prevalent malignancy (18.15%, 557/3068) and ca breast and ca oral cavity were next common malignancy with prevalence of 9.36% (287/3068) and 6.6% (202/3068) respectively. Among male cancer patients, Ca lung was the most prevalent (442/1740, 25.40%) and Ca oral cavity (170/1740, 9.77%) was second most common malignancy. In female cancer patients, Ca breast was the most frequent malignancy (20.85%, 277 /1328) followed by ca ovary (188/1328, 14.15%).

Among young population (<40 years), ca breast was the most prevalent malignancy (8.45%, 83/983) followed by ca oral cavity and ca ovary (6%, 59/983 each). Ca oral cavity was the most prevalent (51/537, 9.5%) and Ca Lung (29/537, 5.4%) was second most frequent (17.94%, 80 /446) followed by ca ovary (59/446, 13.23%).

Among older population (>40 years), ca lung was the most prevalent malignancy (24.17%, 504/2085) followed by ca breast (9.78%, 204/2085). In male cancer patients, Ca lung was the most prevalent (413/1203, 34.33%) and Ca oral cavity (143/1203, 11.89%) was second most common malignancy. In female cancer patients, Ca breast was the most frequent malignancy with prevalence of 22.34% (197/882) and ca ovary was the second prevalent malignancy (129/882, 14.62%).

**Conclusion:** Malignancies are common in young patients (32.04%). Among young population (<40 years), Ca breast was the most prevalent malignancy in young patients followed by ca oral cavity. Among older population (>40 years), ca lung was the most prevalent malignancy followed by ca breast and ca gall bladder.

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### INTRODUCTION

Cancer is one of the common cause of morbidity and mortality in modern era. In developing countries like India, cancers are commonly diagnosed in old age (>40 years) but the incidence of cancers among young population is also increasing. This rise in cancer incidence in young population is becoming a alarming health challenge for the health sector. Cancers in young people has distinct characteristics as compared to older patient cohort.<sup>1,2</sup> There is sparsely of published data on young cancers in India. This study was intended to assess pattern of cancer among young and old population visiting a tertiary cancer treatment center.

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### MATERIAL AND METHODS

This hospital based retrospective, observational, analytic study was conducted at a cancer care tertiary center in Western India during December 2016 to May 2017. Patients who had histologically proven malignancies (both newly diagnosed and previously diagnosed) and visited cancer OPD were included in this study. Patient data were collected from hospital records and stored in Microsoft Excel®. These data were analysed using SPSS® 20 for Windows®.

#### Observations

Total 3068 patients attended cancer OPD during the study period, out of them 2085 (67.96%) patient were >40 years old (age range 41-91 years). The male female ratio was 4:3. The

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maximum patients (590, 19.2%) were in age group of 41-60 years. Majority of the patients were urban population (2493, 81.26 %). (Table No.1)

**Table No.1** Epidemiological profile of study subjects

Age (years)	Total n(%) 3068 (100)	Male n(%) 1740 (56.7)	Female n(%) 1328 (43.3)
0-20	277 (9.0)	177 (5.8)	100 (59.0)
21-40	706 (23.0)	360 (11.7)	346 (11.3)
41-60	1267 (41.3)	677 (22.1)	590 (19.2)
61-80	783 (25.5)	506 (16.5)	277 (9.0)
>80	35 (1.1)	20 (0.7)	15 (0.5)
Inhabitant	<40 years	>40 years	Total
Rural	182 (5.93)	393 (12.8)	575 (18.74)
Urban	801 (26.11)	1692 (55.15)	2493(81.26)
Total	983 (32.04)	2085(67.96)	3068 (100)

Ca lung was the most prevalent malignancy in our study population with prevalence of 18.15% (557/3068). Ca breast and ca oral cavity were next common malignancy with prevalence of 9.36% (287/3068) and 6.6% (202/3068) respectively. Ca ovary and ca gall bladder were next common malignancy with prevalence of 6.12% (188/3068) and 5.93% (182/3068) respectively. (Table No. 2) In male cancer patients, Ca lung was the most prevalent (442/1740, 25.40%) and Ca oral cavity (170/1740, 9.77%) was second most common malignancy. Ca gall bladder was third common malignancy with prevalence of 6.03 % (105/1740). (Table No. 2).

In female cancer patients, Ca breast was the most frequent malignancy with prevalence of 20.85% (277 /1328). Ca ovary was the second prevalent malignancy (prevalence 188/1328, 14.15%) and Ca lung was the third common (115/1328, 8.66%). (Table No. 2)

Among young population (<40 years), ca breast was the most prevalent malignancy in our study population with prevalence of 8.45% (83/983). Ca oral cavity and ca ovary were next common malignancy with prevalence of 6% (59/983) each. (Table No. 2) In male cancer patients, Ca oral cavity was the most prevalent (51/537, 9.5%) and Ca Lung (29/537, 5.4%) was second most common malignancy. Ca gall bladder was third common malignancy with prevalence of 6.51 % (35/537). (Table No. 2). In female cancer patients, Ca breast was the most frequent malignancy with prevalence of 17.94% (80 /446). Ca ovary was the second prevalent malignancy (prevalence 59/446, 13.23%) and Ca colo-rectum was the third common (33/446, 7.4%). (Table No. 2)

Among older population (>40 years), ca lung was the most prevalent malignancy in our study population with prevalence of 24.17% (504/2085). Ca breast and ca gall bladder were next common malignancy with prevalence of 9.78% (204/2085) and 7.05% (147/2085) respectively (Table No. 2) In male cancer patients, Ca lung was the most prevalent (413/1203, 34.33%) and Ca oral cavity (143/1203, 11.89%) was second most common malignancy.

**Table No.2** Type of cancer in study population

	Younger <40 years			Elder >40 years			Total		
	F	M	Total	F	M	Total	F	M	Total
Lung ca	24	29	53(5.39)	91	413	504(24.17)	115	442	557(18.15)
Breast ca	80	3	83(8.44)	197	7	204(9.78)	277	10	287(9.35)
Oral cavity	8	51	59(6.00)	24	119	143(6.85)	32	170	202(6.58)
Ovary	59	00	59(6.00)	129	00	129(6.18)	188	00	188(6.12)
GB ca	18	17	35(3.56)	87	60	147(7.05)	105	77	182(5.93)
Colo-rectal ca	33	9	42(4.27)	64	16	80(3.83)	97	25	122(03.97)
Oesophagus	2	11	13(1.32)	37	47	84(4.2)	39	58	97(03.16)
Tongue	4	11	15(1.52)	13	54	67(3.21)	17	65	82(2.67)
Cervix	13	0	13(1.32)	45	1	46(2.2)	58	1	59(1.92)
Sarcoma	12	19	31(3.1)	6	10	16(0.76)	18	29	47(1.53)
Pancreas ca	1	7	8(0.81)	12	25	37(1.77)	13	32	45(1.46)
Larynx	1	5	6(0.61)	3	35	38(1.82)	4	40	44(1.43)
Stomach	2	8	10(1.01)	8	20	28(1.34)	10	28	38(1.23)
Metastatic Ca	5	4	9(0.91)	7	18	25(1.19)	12	22	34(1.10)
Ewing sarcoma/PNET	8	17	25(2.54)	2	7	9(0.43)	10	24	34(1.10)
Prostate ca				0	27	27(1.29)	0	27	27(0.88)
HCC	0	3	3(0.30)	6	16	22(1.05)	6	19	25(0.81)
RCC	0	2	2(0.20)	4	16	20(0.95)	4	18	22(0.71)
Urinary Bladder	1	1	2(0.20)	1	13	14(0.67)	2	14	16(0.52)
Uterus	4	0	4(0.40)	11	0	11(0.52)	15	0	15(0.48)
Thyroid Ca	7	1	8(0.81)	4	3	7(0.33)	11	4	15(0.48)
Germ Cell Tumor	5	6	11(1.11)	0	3	3(0.14)	5	9	14(0.45)
Seminoma	0	5	5(0.50)	0	7	7(0.33)	0	12	12(0.39)
Bone tumor	2	6	8(0.81)	2	2	4(0.19)	4	8	12(0.39)
Brain Tumor	0	5	5(0.50)	2	4	6(0.28)	2	9	11(0.35)
Retinoblastoma	4	4	8(0.81)				4	4	8(0.26)
Wilms Tumor	4	2	6(0.61)	1	0	1(0.04)	5	2	7(0.22)
Malignant Melanoma	0	2	2(0.20)	1	4	5(0.23)	1	6	7(0.22)
GIST	0	0		0	7	7(0.33)	0	7	7(0.22)
Penile Ca	0	1	1(0.10)	1	4	5(0.23)	1	5	6(0.19)
Aplastic Anemia	26	46	72(7.32)	11	11	22(1.05)	37	57	94(3.06)
AML	26	28	54(5.49)	8	13	21(1.00)	34	41	75(2.44)
ALL	28	76	104(10.5)	18	22	40(1.91)	46	98	144(4.69)
CML	41	65	106(10.7)	34	45	79(3.78)	75	110	185(6.03)
CLL	2	4	6(0.61)	6	32	38(1.82)	8	36	44(1.43)
Lymphoma	28	61	89(9.05)	30	74	104(4.98)	58	135	193(6.29)
Multiple myeloma	4	9	13(1.32)	24	45	69(3.30)	28	54	82(2.67)
MDS	3	10	13(1.32)	4	12	16(0.76)	7	22	29 (0.94)
Total patients	446 (45.4)	537 (54.6)	983 (100)	882(42.3)	1203 (57.7)	2085 (100)	1328(43.29)	1740(56.71)	3068 (100)

Ca gall bladder was third common malignancy with prevalence of 49.87 % (60/1203). (Table No. 2). In female cancer patients, Ca breast was the most frequent malignancy with prevalence of 22.34% (197/882). Ca ovary was the second prevalent malignancy (prevalence 129/882, 14.62%) and Ca lung was the third common (91/882, 10.32%). (Table No. 2)

## DISCUSSION

This study evaluated pattern of cancer among young (<40 years) and old (>40 years) patients. We have compared our results with the available literature from India and international reports.<sup>3-6</sup> Our observation is that 32.04 % of our patients are young. About 49% of the patients were more than 20 years. This observation correlates with other series as well.<sup>1,3-7</sup> The male:female ratio of 4:3 is higher than that reported from India and international. This might be due to preference for male child and some cases are common in males.<sup>8</sup>

Among young population (<40 years), ca breast was the most prevalent malignancy followed by ca oral cavity. In male cancer patients, Ca oral cavity was the most prevalent followed by Ca Lung. This may be contributed by excessive use of tobacco and smoking in Indian male. In female cancer patients, Ca breast was the most frequent malignancy and ca ovary was next common. In previous studies, the most common cancer was head and neck carcinoma, followed by CNS tumors and carcinoma of breast.<sup>6</sup> In US SEER database, the skin malignancies were more common, followed by lymphomas and malignancies of female genital tract which may be due to tobacco and smoking awareness in US.<sup>7</sup> Etiological factors for cancers such as tobacco use, alcohol consumption, dietary factors, viruses, chronic infections, radiation, genetic and environmental factors along with racial and ethnic differences are also responsible for the observed variation among different reports.<sup>6,10</sup>

In our study old population affected with malignancy was 67% which is equivalent to previous Indian studies and few international references.<sup>12-21</sup> Lung cancer was the most prevalent malignancy in this cohort our study. Similar to our finding, many previous Indian studies also reported lung cancer as the most prevalent malignancy in these patients.<sup>22-23</sup> This finding is also in echo with meta-analysis of various cancer registries.<sup>24</sup> The breast and ca gall bladder were the next common cancer in old patients in current study. This observation is also matches with metaanalysis of various cancer registries.<sup>24</sup> The results of the current study also show lung cancer as the most common malignancy in man and breast cancer in women. For predicting these cancer incidence cases for the year 2016, Balkrishna *et al*<sup>22</sup> used population estimated by Registrar General and Mumbai registry data of 1971-2001 duration. These time and geographic difference might be the reason for some difference of their prediction and our study results. We found ca ovary as second most common malignancy in old female patients. This difference might be explained by the short study duration (6 months) and a single center study; we need large sample size for validation of our results. So lung carcinoma and oral cancer are the most frequent malignancy among old male population in current study making them major public health issues from oncology side and suggesting the priority of tobacco control for cancer control in India. In fact tobacco control will reduce many

other chronic diseases along with tobacco-related cancers.<sup>25-26</sup> In current study, among female cancer patients, Ca breast was the most frequent malignancy in old female. Ca ovary was the second prevalent malignancy. Result of previous studies and meta-analysis of various cancer registries also matches with our study.<sup>24,27-28</sup> Rajendra *et al*.<sup>24</sup> observed an increase in breast cancer in Indian populations. The increase in breast cancer might be explained by redistribution of risk factors including late marriage and life style changes occurring as a result of socio-economic improvement.<sup>29</sup> The decline in cervical cancer might be due to family planning, greater awareness for genital hygiene, and visiting clinicians at pre-clinical stage. Whatever be the reason, the highest prevalence of breast cancer highlights needs for the control of female breast cancer at the primary, secondary and tertiary level within India. The breast cancer can be detected at an early stage via self-breast examination or clinical breast examination.<sup>30</sup>

## Limitations

Our study had some limitations This study was done at a tertiary care centre with in a limited time period of 6 months resulting in a limited sample size, thus the results may not imply on general population, and further studies with a larger sample size and longer duration time frame are needed. Lack of survival analysis was the another limitation.

## CONCLUSION

Malignancies are common in young patients (32.04%). Among young population (<40 years), Ca breast was the most prevalent malignancy in young patients followed by ca oral cavity. Among older population (>40 years), ca lung was the most prevalent malignancy followed by ca breast and ca gall bladder.

The spectrum of malignancies and their demographic distribution in cancer patient population varies among different age groups and among different cancer centers within India. Collaborative efforts are required to promote awareness for prevention, screening programmes for early detection and interdisciplinary approach for management of cancers to improve prognosis and better understanding of etiological factors for its causation.

**Conflict of Interest:** None of the authors have a Conflict of Interest

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