

Prevalence of various cancers in a rural setting in India –Karaikal

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Abstract

Introduction: To study the prevalence of various cancer in a rural setting and to study the distribution of various cancers among diverse age and sex groups.

Materials and Methods: The study was conducted on 200 subjects who were diagnosed to have malignancy by histopathology in Vinayaka Missions Research Foundation Karaikal Pondicherry District. The prevalence of various cancers was evaluated and further correlated with age and sex of the patient.

Results: The study enrolled 200 malignant cases with age ranging from 13yrs to 85 years. 54% were female and 46% were male. Out of 200 cases 40 cases that is 20% of malignant cases were there in oral cavity buccal mucosa. Next comes breast accounting for 17%, followed by colon and rectum – 9.5%. Regarding type of malignancy, squamous cell carcinoma is the most common malignancy 35% followed by adenocarcinoma 17.5% and infiltrating duct carcinoma- 15%. Below 18 years malignancy is reported only in thyroid and soft tissues. Maximum number of malignant cases were reported in age group 40-60years (87 cases).

Conclusion: Our study shows increase in incidence of cancer in Karaikal which was only 26 in year 2001-2002. Now in 2016-2017 it was 200. Also the organs affected shows slight variation from Indian scenario where lung is the most common malignancy. But in our study oral cancers are maximum. This study highlights the need for cancer screening programs to be individualised for regions and the importance of maintaining cancer registries.

Keywords: Malignancy, Oral cancers, Squamous cell carcinoma, Karaikal.

Introduction

According to WHO estimates for 2011, cancer is the leading cause for death compared to coronary heart disease and stroke.¹ The continuing demographic and epidemiologic transitions signal an ever increasing cancer burden in next ten years, particularly in low and middle income countries, with over 20 million new cancer cases expected annually as early as 2025.² Burden of cancer is increasing in the world also in India. The International Agency for Research on Cancer GLOBOCAN project has predicted that India's cancer burden will nearly double in the next 20 years, from slightly over a million new cases in 2012 to more than 1.7 millions by 2035.³

In this outset we collected the number of cancer cases received in our department for past two years.

Materials and Methods

The prospective study was conducted at department of Pathology Vinayaka Missions Research Foundation Karaikal from January 2016 to December 2017.

Inclusion Criteria: All subjects diagnosed to have biopsy proven malignancy at any site are included in the study.

Exclusion Criteria: When same patient is having incision biopsy as well as radical procedure, only radical procedure is included in the study so that same patient won't be repeatedly included in the study.

Period of Study: January 2016 – December 2017 (2 years)

Samples are formalin fixed. Appropriate bits were taken. Tissues are processed in increased grades of alcohol, then absolute alcohol, then clearing in 2 changes of xylene, paraffin wax infiltration in 2 changes. Then the tissue is

embedded in wax blocks. Sections of 5 microns thickness are taken using rotary microtome. Stained with haematoxylin and eosin staining and viewed under microscope.

Results

The study enrolled 200 malignant cases with age ranging from 13yrs to 85 years. 54% were female and 46% were male. Out of 200 cases 40 cases, that is 20% of malignant cases were there in oral cavity buccal mucosa. If tongue is also included it hikes to 25.5%. Next highest malignancy reported in breast accounting for 17%, followed by colon and rectum – 9.5%. lowest frequency in testes, vulva, bladder and alveoli. No case were reported in kidney in those period. Regarding type of malignancy, squamous cell carcinoma is the most common malignancy 35% followed by adenocarcinoma 17.5% and infiltrating duct carcinoma- 15% below 18 years malignancy is reported only in thyroid and soft tissues. Maximum number of malignant cases were reported in age group 40-60years (87 cases). Squamous cell carcinoma is the most common malignancy in oral cavity, cervix, oesophagus, vulva, penis, vagina, tongue and respiratory tract. Adenocarcinoma is most common in colon, rectum and stomach. Breast IDC is most common. In thyroid papillary carcinoma. Foot – verrucous carcinoma and in skin basal cell carcinoma are most common.

Table 1: Gender wise distribution of cancer

		Frequency	Percent
Valid	Male	92	46.0
	Female	108	54.0
	Total	200	100.0

Table 2: Organ wise distribution of cancer

		Frequency	Percent
Valid	Buccal mucosa	40	20.0
	Breast	34	17.0
	Testis	2	1.0
	Foot	9	4.5
	Thyroid	10	5.0
	Cervix	10	5.0
	Stomach	14	7.0
	Colon and rectum	19	9.5
	Alveolus	1	.5
	Skin	5	2.5
	Oesophagus	5	2.5
	Vulva	2	1.0
	Endometrium	4	2.0
	Soft tissue	4	2.0
	Lymph node	4	2.0
	Ovary	4	2.0
	Bladder	2	1.0
	Omentum	1	.5
	Penis	5	2.5
	Liver	1	.5
Vagina	2	1.0	
Salivary gland	3	1.5	
Tongue	11	5.5	
Respiratory tract	8	4.0	
Total	200	100.0	

Table 3: Age

Descriptive Statistics					
	N	Minimum	Maximum	Mean	Std. Deviation
Age	198	13	85	55.16	13.555

Table 4: Type of malignancy

		Frequency	Percent
Valid	Adenocarcinoma	35	17.5
	Squamous cell carcinoma	70	35.0
	Infiltrating duct carcinoma	30	15.0
	Verrucous carcinoma	18	9.0
	Papillary carcinoma	9	4.5
	Germ cell tumor	2	1.0
	Lymphoma	3	1.5
	Melanoma	3	1.5
	Basal cell carcinoma	4	2.0
	Poorly differentiated	7	3.5
	Sarcoma	4	2.0
	Mucoepidermoid	1	.5
	Adenoid cystic	2	1.0
	Urothelial	2	1.0
Hepatocellular	1	.5	

Pap.serous. cyst. adeno. ca	2	1.0
Phyllodes	3	1.5
Mucinous.cys.ade.ca	1	.5
Follicular	1	.5
Adeno squamous	1	.5
Krukenberg	1	.5
Total	200	100.0

Table 5: Age wise classification of organs involved

Age group		Frequency	Percent	
18 and below	Valid	Thyroid	2	66.7
		Soft tissue	1	33.3
		Total	3	100.0
19-30	Valid	Buccal mucosa	1	16.7
		Testis	1	16.7
		Thyroid	1	16.7
		Oesophagus	1	16.7
		Soft tissue	1	16.7
		Omentum	1	16.7
		Total	6	100.0
		31-45	Valid	Buccal mucosa
Breast	11			26.8
Foot	1			2.4
Thyroid	5			12.2
Cervix	5			12.2
Colon and rectum	2			4.9
Alveolus	1			2.4
Vulva	1			2.4
Lymph node	1			2.4
Ovary	2			4.9
Penis	3			7.3
Salivary gland	2			4.9
Tongue	1			2.4
Total	41			100.0
46-60	Valid	Buccal mucosa	20	23.0
		Breast	20	23.0
		Testis	1	1.1
		Foot	4	4.6
		Thyroid	2	2.3
		Cervix	3	3.4
		Stomach	8	9.2
		Colon and rectum	6	6.9
		Skin	2	2.3
		Oesophagus	3	3.4
		Vulva	1	1.1
		Endometrium	2	2.3
		Soft tissue	1	1.1
		Lymph node	2	2.3
		Ovary	2	2.3
		Penis	1	1.1
		Liver	1	1.1
		Vagina	1	1.1
		Tongue	4	4.6
		Respiratory tract	3	3.4
Total	87	100.0		

60 and above	Valid	Buccal mucosa	13	20.6
		Breast	3	4.8
		Foot	4	6.3
		Cervix	2	3.2
		Stomach	6	9.5
		Colon and rectum	11	17.5
		Skin	3	4.8
		Oesophagus	1	1.6
		Endometrium	2	3.2
		Soft tissue	1	1.6
		Lymph node	1	1.6
		Bladder	2	3.2
		Penis	1	1.6
		Vagina	1	1.6
		Salivary gland	1	1.6
		Tongue	6	9.5
Respiratory tract	5	7.9		
Total	63	100.0		

Table 6: Classification based on organ and types of cancer

Organ		Frequency	Percent	
Buccal mucosa	Valid	Squamous cell carcinoma	29	72.5
		Verruocus	10	25.0
		Adeno squamous	1	2.5
		Total	40	100.0
Breast	Valid	IDC	30	88.2
		Poorly differentiated	1	2.9
		Phyllodes	3	8.8
		Total	34	100.0
Testis	Valid	Germ cell	2	100.0
Foot	Valid	Squamous cell carcinoma	2	22.2
		Verrucous	7	77.8
		Total	9	100.0
Thyroid	Valid	Papillary	9	90.0
		Follicular	1	10.0
		Total	10	100.0
Cervix	Valid	Adenocarcinoma	1	10.0
		Squamous cell carcinoma	9	90.0
		Total	10	100.0
Stomach	Valid	Adenocarcinoma	13	92.9
		Poorly differentiated	1	7.1
		Total	14	100.0
Colon and rectum	Valid	Adenocarcinoma	15	78.9
		Lymphoma	1	5.3
		Melanoma	2	10.5
		Poorly differentiated	1	5.3
		Total	19	100.0
Alveolus	Valid	Poorly differentiated	1	100.0
Skin	Valid	Squamous cell carcinoma	1	20.0
		Basal cell carcinoma	4	80.0
		Total	5	100.0
Oesophagus	Valid	Squamous cell carcinoma	2	40.0
		poorly differentiated	3	60.0
		Total	5	100.0
Vulva	Valid	Squamous cell carcinoma	2	100.0

Endometrium	Valid	Adenocarcinoma	4	100.0
Soft tissue	Valid	Sarcoma	4	100.0
Lymph node	Valid	Adenocarcinoma	1	25.0
		Squamous cell carcinoma	1	25.0
		Lymphoma	2	50.0
		Total	4	100.0
Ovary	Valid	pap.serous. cyst. adeno. ca	2	50.0
		mucinous.cys.ade.ca	1	25.0
		Krukenberg	1	25.0
		Total	4	100.0
Bladder	Valid	Urothelial	2	100.0
Omentum	Valid	Adenocarcinoma	1	100.0
Penis	Valid	Squamous cell carcinoma	4	80.0
		Verruocus	1	20.0
		Total	5	100.0
Liver	Valid	Hepatocellular	1	100.0
Vagina	Valid	Squamous cell carcinoma	2	100.0
Salivary gland	Valid	Mucoepidermoid	1	33.3
		Adenoid cystic	2	66.7
		Total	3	100.0
Tongue	Valid	Squamous cell carcinoma	11	100.0
Respiratory tract	Valid	Squamous cell carcinoma	7	87.5
		Melanoma	1	12.5
		Total	8	100.0

Discussion

In 2001-2002 the number of cases reported in whole Karaikal is 95 cases in which VMMC reported 27 cases. Now in 2016-2017, the number of malignant cases reported in VMMC alone in our study is 200 which is 7.4 times greater than what is reported in 2001-2002.⁴

In the present study in Karaikal, five most common cancers are oral cavity, breast, colon rectum, stomach, tongue, thyroid and cervix. This is little different from Indian scenario where five most common cancers were breast, cervix, oral cavity, lung and colorectum.⁵

Estimated new cancer cases worldwide³ for oral cancer is 2.1 which is very low compared to our study where it is 20, very high incidence of oral cancer may be attributed to the habit of tobacco chewing which is very common in our population. Tobacco, betel quid, alcohol, poor diet and nutrition, viral infections, dental factors are some of the most common risk factors for oral cancer.⁶ In our study all the 50 patients with oral cancers have the habit of tobacco chewing. NFHS 4 data shows that 38.9% of urban men and 48% of rural men, 4.4% of urban women and 8.1% of rural women use tobacco. 56.6% of men in the age group 35-49 use any kind of tobacco and 11.8% of women use any kind of tobacco which could attribute to increase in oral cancers in our population.⁷ Recently many studies are showing association of small subgroup of oral cancers with HPV.⁸ Breast cancer incidence is 11.9 in our study it is 17%, colorectum it is 9.7, in ours it is 9.5 more or less equal, cervix its 3.7, in ours its 5. Thyroid it is 2.1 but in ours its 5 higher compared to world. For which any association of increase in thyroid malignancy especially papillary

carcinoma with costal region need to be studied as our college is situated in costal belt. Lung cancer its 12.9 where as in our study its only 4%.

Cancer atlases have been particularly useful in highlighting variations in the risk of different cancers according to place of residence, between countries, and also within them.⁹ There are examples from the United States,^{10,11} Scotland¹² and China.¹³

The relative proportions and incidence rates of cancers of sites associated with the use of tobacco show variations for specific sites across different geographic areas. Cancers of the mouth and tongue seem to be particularly frequent in males and females in the southern states. This may be attributed to the diverse types of tobacco products and the manner in which they are consumed in different populations in India.¹⁴

Thyroid cancer has been noted to be common in other coastal areas of the world with large populations of fishermen,¹⁵ but there is no evidence that thyroid cancer risk is elevated among people, male or female, with a relatively high intake of iodine from fish and seafood.¹⁶ Follicular carcinomas may be related to iodine deficiency; they are more common in populations living in areas where endemic goitre is common.¹⁷ The southwest coast of the country is known for its high level of natural background radiation.¹⁸ Whether the occurrence of a relatively higher incidence of thyroid cancer has any relevance to such radiation needs to be investigated, although radiation from medical sources, and in atomic bomb survivors is known to increase thyroid cancer risk.¹⁹

Conclusion

In our present study the incidence of cancer involving various sites in Karaikal is little different from Indian scenario and global scenario. Oral cancers accounts maximum for which further steps to be taken against the various etiological factors. Breast cancer ranks second which is actually easily diagnosable palpable malignancy. For which we have to create self-awareness among public and educate them regarding breast self-examination, role of mammogram and FNAC. Third one is colorectum and stomach for which we can go for screening endoscopies regular basis to find the malignancy in early stage itself and to eradicate H.pylori. Fourth one is cervix for which pap screening should be done regularly. Fifth thyroid cancers for which further studies has to be done to find any relationship between costal areas and incidence of thyroid papillary cancers.

Altogether cancer screening programs need to be individualised for regions for which maintenance of cancer registries play a vital role.

Conflict of Interest: None.

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