

Hospital Cancer Registry in a Tertiary Care Hospital in South Tamilnadu – A Comparative Analysis of 2016 Annual Data with a Decade Old Data on Cancer Incidence

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Abstract:

Background: Cancer is among the leading causes of death worldwide. In 2012, there were 14 million new cases and 8.2 million cancer-related deaths worldwide.

Objectives: To assess the cancer incidence of Tirunelveli medical college in 2016. To compare with the data for the year 2007-2011.

Methods: In Tirunelveli Medical College, an analysis of reported cancer cases obtained from the records of surgical pathology in 2016 and compared with previous data from 2007-2011.

Results: It showed an increased incidence of head and neck cancers and a decline in the incidence of cervical cancers during the last decade. Many other cancers also show a varying trends during this period

Conclusion: The cancer registry shows the magnitude of cancer cases in Tirunelveli medical college and hence helps in planning and evaluation of cancer control activities.

Keywords: cancer, cancer registry, incidence

Date of Submission: 12-06-2018

Date Of Acceptance: 27-06-2018

I. Introduction

Cancer is a major cause of morbidity and mortality in both developing and developed nations. A systematic collection of data on cancer termed as "Cancer Registry" captures a complete summary of the patient's epidemiological data, history, clinical and pathological diagnosis, and outcome if any. In 1926, Yale-New Haven Hospital became the first institute to start a cancer registry¹ while in India, the National Cancer Registry Programme (NCRP) of the Indian Council of Medical Research (1981) were the earliest².

In Tamilnadu, the Madras Metropolitan Cancer Registry, a population based cancer registry was established at the Cancer Institute, Adyar in 1981.³

This hospital based cancer registry situated in rural south Tamilnadu was started in 1997 at the department of pathology. The data accumulated is being published in various intervals.

II. Materials and Methods

The permission from the institutional ethical committee of tirunelveli medical college was obtained. The TVMC cancer registry data for the year 2007, 2011, 2016 pertains to all specimens received for diagnosis at the department of pathology. The data of the patients were recorded in a pretested structured format which included personal details, domiciliary data, site of tumor and diagnosis with ICD-O code. The data reported here pertains to patients domiciled in the four southern districts of Tamilnadu - Tirunelveli, Tuticorin, Kanyakumari and Virudhunagar. The entries made during the year 2016 were tabulated and statistically analyzed and compared with the statistical data for the year 2007 to 2011 which was already published⁴

III. Results

The incidence of cancer in Tirunelveli Medical college rises from 2007(11.1%) to 2016(12.18%)(Table 1). Cancer incidence in male shows a tremendous rise from 2007(35.4%) to 2011(47.0%) and then a minimal decline to 45.03% in 2016. Cancer incidence in female shows a steep fall from 2007(62.4%) to 2011(51.4%) and then shows a mild rise to 54.19% in 2016. Incidence of cancer in children gradually decreases from 2007 (2.1%) to 2011(1.60%) and then to 0.70% in 2016(table 1). The incidence of cancer were analysed according to age(Table 1). In males, the mean age increases from 54.9% in 2007 to 56.9% in 2011 and then mild rise to

57.4% in 2016. In female the mean age rises from 51.4% in 2007 to 52.3% in 2011 and then maintains a plateau phase till 2016(52.8%).

Table 1: Comparison of incidence, gender and mean age of 2007, 2011 and 2016

	INCIDENCE			GENDER			MEAN AGE	
	Total no. of biopsies	Total no. of cancers	%	Male %	Female%	Children%	Male	Female
2007	5941	661	11.10	35.40	62.40	2.10	54.9	51.4
2011	8349	1060	12.7	47.00	51.40	1.60	56.9	52.3
2016	7528	917	12.18	45.03	54.19	0.70	57.4	52.8

Table 2 explains incidence of cancers in various sites in 2007, 2011 and 2016

Table 2: Site based cancer incidence

S.NO	SITES	2007	2011	2016
1	Head and neck	107	347	263
	1.Oral cavity	46	137	129
	2.Oropharynx	30	68	29
	3.Nasopharynx	4	12	16
	4.Hypopharynx	8	57	28
	5.Larynx	5	47	50
	6.Salivary gland	12	21	11
	7.Eye and ear	2	5	0
2	Breast	106	116	143
3	Thyroid	42	62	44
4	Gastrointestinal tract	84	118	141
	1.Esophagus	4	14	32
	2.Esophageo gastric junction	0	09	0
	3.Stomach	34	32	62
	4.Small intestine	2	4	8
	5.Colocetum	26	39	36
	6.Anus	4	9	3
	7.GIT NOS	14	20	0
5	Female genital tract	157	170	155
	1.Endometrium	7	6	12
	2.Cervix	134	141	109
	3.Fallopian tube	0	1	0
	4.Ovary	11	17	23
	5.Vagina	3	4	4
	6.Vulva	2	1	7
5	Male genital tract	18	37	27
	1.Penis	13	25	18
	2.Prostate	5	9	6
	3.Testis	0	3	3
6	Urinary tract	22	26	37
	1.Kidney	4	4	3
	2.Ureter	0	1	0
	3.Bladder	18	20	34
7	Bone and soft tissue	4	2	12
8	Skin	22	16	21
9	Lymph node	56	58	39
10	Hematopoeitic system	-	26	0
11	Lung	-	-	9
12	SOL	-	-	12
11	Others	43	82	14

Table 3: The top 10 leading sites of cancer in 2007, 2011 and 2016 (male and female)

S.NO	2007	2011	2016
	Site	no.(%)	Site and no.(%)
1	Cervix(c53)	134 (20.27%)	Head and neck(c00-14&c30-32) 347 (32.74%)
2	Head and neck(c00-14&c30-32)	107 (16.19%)	Cervix(c53) 141 (13.30%)
3	Breast(c50)	106 (16.04%)	Gastrointestinal tract (c15-c26) 118 (11.14%)
4	Gastrointestinal	84	Breast(c50) 116
			Gastrointestinal tract (c15-c26) 141 (15.30%)
			Cervix(c53) 109

5	tract (c15-c26)	(12.71%) 42		(10.94%) 62		(11.80%) 44
6	Thyroid(c73)	(6.35%) 32	Thyroid(c73)	(5.85%) 41	Thyroid(c73)	(4.70%) 39
7	Lymphnode- primary(c77)	(4.84%) 24	Lymphnode- primary(c77)	(3.87%) 38	Lymph node(c77)	(4.25%) 37
8	Lymphnode- secondary(c77)	(3.63%) 22	Lung(c34.9)	(3.58%) 37	Urinary tract(c64-c68)	(4.03%) 27
9	Urinary tract (c64-c68)	(3.33%) 22	Male genital tract(c62-63)	(3.49%) 26	Male genital tract(c62-63)	(2.94%) 21
10	Skin(c44)	(3.33%) 88	Urinary tract (c64- c68)	(2.45%) 26	Skin(c44)	(2.20%) 12
	Others	(13.31%)	Haematopoeitic systemc42)	(2.45%) 26	Bone and soft tissue/SOL	(1.30%) 12

The table 3 gives the ten leading sites of cancer in 2007,2011 and 2016 for both male and female.In 2007 Predominant cancers were of cervix (20.27%) and it is the first leading site of cancer followed by head and neck(16.19%) in the second place followed by breast(16.04%) followed by GIT (12.71%) followed by thyroid(6.35%) followed by lymph node-primary(4.84%) followed by lymph node-secondary(3.63%)followed by urinary tract(3.33%) followed by skin(3.33%) .In 2011 predominant cancers were of head and neck (32.74%) and it is the first leading site of cancer followed by cervix(13.3%) in the second place followed by GIT(11.14%) followed by breast ((10.94%)%) followed by thyroid(5.85%) followed by lymph node-primary(3.87%) followed by lung (3.58%)followed by male genital tract(3.49%) followed by urinary tract(2.45%) followed by hematopoetic system(2.45%).In 2016 major cancers were of head and neck(28.6%) and it is the first leading site of cancer followed by breast(15.5%) in the second place followed by GIT cancers(15.3%) followed by cervix ((11.8%) followed by thyroid(4.7%) followed by lymph node(4.25%) followed by urinary tract(4.03%)followed by male genital tract (2.94%) followed by skin(2.2%) followed by bone and soft tissue(1.30%)

The incidence of head and neck cancers ranks second in 2007(16.1%) gradually rises to 2011(32.74%) and shows a decline towards 2016(28.6%) but however occupies a first position. Majority of the head and neck cancers are from the oral cavity.Predominant of them are squamous cell carcinoma.(figure 1)

The breast cancer incidence in 2007 drops from third position (16.04%) to fourth position in 2011(10.94%) and again rise to third position in 2016 with a incidence of 15.5%.however the breast cancer incidence had reduced over 10 years from 2007(16.04%) to 2016(15.5%)

The incidence of GIT cancers show a gradual increase from 2007(12.71%) to 2009(14.8%) then declines to 11.14% in 2011 and rise to 15.5% in 2016.Among the GIT cancer predominant cancers arise from the stomach followed by colorectal carcinoma.

The cervical cancer incidence drops from 2007(20.27%) to 2011(13.30%) From 2011 to 2016 cervical cancer incidence shows a declining pattern to 11.8% .In 2016 cervical cancer ranks fourth .Predominant cancers are squamous cell carcinoma

Thyroid cancers show a gradual decline from 2007(6.35%) to 2011(5.85%) to 2016(4.7%).

The incidence of urinary tract cancer drops from 3.33% in2007 to 2.45% in 2011 and then shows a increase to 4.03%.

The male genital tract tumors emerged as a new cancer in 2011 with a incidence of 3.49% and drops down to 2.94% in 2016

Skin cancer incidence falls from 3.3% in 2007 to 2.2% in 2016 New emerging cancers in 2016 are bone and soft tissue and SOL with an incidence of 1.3%

Figure:1 Varying trends of cancer in 2007,2011 and 2016

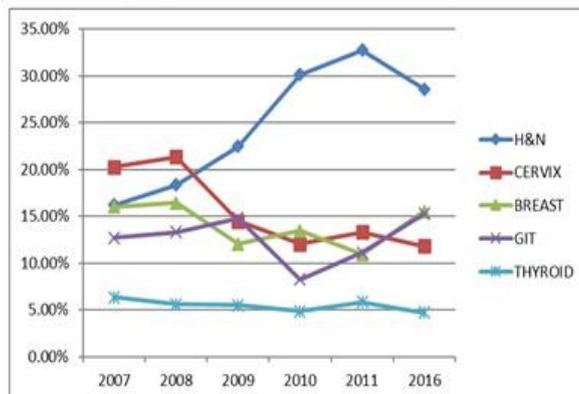


Table 4: Top five leading sites in cancer 2016 male and female

S.NO	Leading sites in male		Leading sites in female	
	Site	%	Site	%
1	Head and neck	45.6	Breast	28.3
2	Gastrointestinal tract	22.5	Cervix	21.7
3	Male genital tract	6.4	Head and neck	14.5
4	Lymph node	6.25	Gastrointestinal tract	9.3
5	Urinary tract	5.5	Thyroid	7.3

Table 4 shows the top five leading sites in male and female in 2016. In male the top five leading sites were head and neck (45.6%) followed by GIT (22.5%) followed by male genital tract (6.4%) followed by lymph node (6.25%) followed by urinary tract (5.5%). In female the top five leading sites were breast (28.3%) followed by cervix (21.7%) followed by head and neck (14.5%) followed by GIT (9.3%) followed by thyroid (7.3%)

IV. Discussion

The national cancer registry program provides a population based data from a selected network of 28 cancer registries located across India. It has been operational since 1982 with the coordinating unit at Bangalore i.e. National Centre for Diagnosis and Informatics Research (NCDIR) under Indian Council of Medical Research⁵. In addition to the primary source the Million death study is another resource that provides nation-wide cancer burden and on regional, state and rural-urban variations⁶. GLOBOCAN estimates that about 14 million new cases and 8 million deaths were reported worldwide of which nearly 17% occurs in India⁷.

The cancer registries provide details on burden and patterns of cancer in developing countries and helps in further research into etiology and prevention. There are two types of cancer registry a) Hospital based and b) Population based. Cancer registries systematically collect information on all reportable neoplasm occurring in a geographically defined population from multiple sources. Population based registries play a vital role in epidemiology by estimating the incidence and prevalence of the disease in the community, thereby helps in planning of cancer control programs and monitoring the effectiveness of screening programs. The data in hospital based registries are used for administrative purpose and for analysing clinical performances but it provides number of cancer patient in a particular hospital only. The objective of hospital based registries is to assess patient care, participate in clinical research to evaluate therapy, provide an idea of the patterns of cancer in the area, help plan hospital facilities. Our registry is a hospital based registry operational since 1997.

The population of the Tirunelveli district is 3077233 (2011 census data). The density of population per sq.km is 460 persons with Tirunelveli, Tenkasi and Ambasamudram being the most populated taluks in the district. The gender ratio is 1023 females for every 1000 males with a male population of 1520912 and females 1556321 as per 2011 census. Our hospital is the only tertiary medical care centre in this district⁸.

The incidence of cancer in Tirunelveli medical college rises from 2007 (11.1%) to 2016 (12.18%). In SEER study 2015 updates, the number of new cases at any site was 2.7 per 100000 men and women per year. The predominant cancers in our study were in the age range of 40-59 years with an average age of incidence of 54.9 years. In the UK, the average age of cancer incidence is above 70 years⁹. The average age adjusted rates of cancer in India as per the NCRP data for 2016 is 172 and most of the patients were in the range of 40.9 to 270.7 years⁹. The proportion of childhood cancers reported is 1.09% in our study. The NCRP data (2016) reports the proportion of childhood cancer relative to all the other cancers as between 0.7-4.4%.¹⁰ The SEER data reports the mean age of diagnosis is 65 years¹¹

Cancer incidence in male shows a tremendous rise from 2007 (35.4%) to 2011 (47.0%) and then a minimal decline to 45.03% in 2016. Cancer incidence in female shows a steep fall from 2007 (62.4%) to 2011 (51.4%) and then shows a mild rise to 54.19% in 2016. According to SEER data 2004-2013 cancer incidence was stable in women and declines annually by 2% in men¹⁰

In childhood (0-14) years, the frequent tumor reported was Non Hodgkins Lymphoma. The most common tumor encountered in childhood is leukemia and lymphoma in India as per NRCP data (2016). Internationally also the most common tumor encountered in childhood are leukemia and lymphoma. Most common site in the age group 0-19 yrs is lymph node. Lymphoma are the most common tumor detected worldwide in teenagers whereas in India the common tumors were carcinomas, lymphoma and leukemia. The most common carcinomas were from GIT, genitourinary and from breast. Most common site encountered in age group 20-59 is breast. Predominant site for the age group 60-80 is cervix and for patients >80 yrs most common site is palate. In extremes of age group peak incidence was seen among males. In mid adult age group 20-59 peak incidence was in female. The number of oral cancer patients were more than lung cancer in the age group 30-69 years than lung cancers.

In our study most cancer cases were noted among females. According to ICMR study most cases in India were males due to habit of tobacco usage. NCRP 2012-14 states that both Bangalore and Chennai have higher incidence in women when compared to men. In Tirunelveli and Kanyakumari district cancer incidence peaks in females. In Tuticorin and Virudhunagar peak incidence was noted among males.

The most common sites encountered in the study were head and neck, breast and GIT. The top five leading sites in male are head and neck (45.6%) followed by GIT (22.5%) followed by male genital tract (6.4%) followed by lymph node (6.25%) followed by urinary tract (5.5%). The top five leading sites in female are breast (28.3%) followed by cervix (21.7%) followed by head and neck (14.5%) followed by GIT (9.3%) followed by thyroid (7.3%). The top five leading sites of cancer worldwide in males includes lung, prostate, colorectum, stomach and liver whereas in females were breast, colorectum, lung, cervix and stomach. The top leading sites of cancer in India in males are lung, colorectal, pharynx, stomach, head and neck and in females the top 5 sites were breast, ovary, lip, oral cavity, lung and cervix. The top five leading sites in males were lung (9.8%), stomach (9.3%), mouth (8.0%), tongue (7.0%) and prostate (5.4%). In females the top leading sites were lung (11.3%), stomach (10.8%), mouth (9.2%), tongue (8.2%) and prostate (6.2%). SEER data 2007-2013 shows that the most common cancer in men were prostate, lungs and colorectum and the most common cancer in women were breast, lung and colorectum¹¹

The incidence of head and neck cancers rises according to Chennai cancer registry reports. Our present study also shows an increased incidence from 2007 to 2016. ICMR study (1982-2005) has shown that there was an increased incidence of breast cancer. Another study by Swaminathan et al also shows an increased incidence. In the present study the breast cancer incidence had reduced over 10 years from 2007 (16.04%) to 2016 (15.5%) which is contradictory.

The incidence of GIT cancers shows an increased incidence from 1982-2006 (R. Swaminathan et al). This study increase from 2007 (12.7%) to 2016 (15.3%). In 1988 Delhi cancer registry reported a reduction in the incidence of cancer from 25.9% to 19.1% in 1998 and further declined to 18.9% in 2005. The Chennai cancer registry also shows a decrease in cervical cancer incidence from 33.4% in 1991 to 20% in 2005. The cervical cancer incidence drops from 2007 (20.27%) to 11.8% in 2016. Thyroid cancers show a gradual decline from 2007 (6.35%) to 2011 (5.85%) to 2016 (4.7%). The incidence of urinary tract cancer drops from 3.33% in 2007 to 2.45% in 2011 and then shows an increase to 4.03%. The male genital tract tumors emerged as a new cancer in 2011 with an incidence of 3.49% and drops down to 2.94% in 2016. SEER data 2004-2013 shows a decline in lung and colorectum and increasing or stable in cancers of breast, thyroid and uterus.

In this study, the top five leading sites in male are head and neck (45.6%) followed by GIT (22.5%) followed by male genital tract (6.4%) followed by lymph node (6.25%) followed by urinary tract (5.5%). As per NCRP the top five leading sites in Chennai in male are lung (10%) followed by mouth (9.7%) followed by stomach (9.3%), tongue (7.7%) and esophagus (4.7%). The top five leading sites in female in the present study are breast (28.3%) followed by cervix (21.7%) followed by head and neck (14.5%) followed by GIT (9.3%) followed by thyroid (7.3%). The top five leading sites in Chennai as per NCRP Breast (24.3%) followed by cervix (22.5%) followed by ovary (5.6%), stomach (4.3%) and mouth (4.2%). In Tirunelveli district the common age of presentation was 40-59, incidence peaks in females and the most common reported sites of cancer in Tirunelveli was breast, cervix and stomach.

V. Summary and conclusion

This study analyzed the incidence of cancer in Tirunelveli Medical College Hospital during 2016 and was compared with the previous data collected during the period of 2007-2011 which was already published. This study shows an increased incidence of cancer from 2007 to 2011. The incidence of cancer in males increased whereas the incidence of cancer in females and children decreases. The mean age for males and females were found to increase from 2007 to 2016. The cancer in head and neck, gastrointestinal tract and urinary tract shows an increasing trend. The decreasing trend was seen in cervix, breast, male genital tract and skin cancers. Thyroid cancers show a stable phase. Newly emerging cancers were bone and soft tissue tumors and space occupying lesions.

This study highlights reveals magnitude of cancer patients attending Tirunelveli medical college with an additional data on cancer incidence based on age, gender and anatomical site. This data could help in planning and evaluation of the cancer control activities and assessing the care provided to cancer patients in future.

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Hidhaya Fathima K "Title: Hospital Cancer Registry in a Tertiary Care Hospital in South Tamilnadu – A Comparative Analysis of 2016 Annual Data with a Decade Old Data on Cancer Incidence."IOSR Journal of Dental and Medical Sciences (IOSR-JDMS), vol. 17, no. 6, 2018, pp 28-33.