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Cancer Estimation in Male Population of Patan District, Gujarat

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ABSTRACT

Background: Cancer can be caused by variety of factors and may develop over a number of years. This paper provides a synopsis of the incidence of male cancers in Patan district, Gujarat State.

Objectives: To determine incidence of Head and neck cancers, tobacco related cancers, leading cancer sites and cancer mortality for males in Patan district.

Materials and Methods: The Gujarat Cancer and Research Institute was the prime source of data on cancer cases, along with other sources which were recorded cancer cases contributed data for this study. Information on cases from these sources were subjected to meticulous verification regarding repetition, place of residence and other potential errors. To ensure maximally complete data, cases registered between 1st January 2011 and 31st December 2011 was considered for the present study.

Results: Total 310 male cancer patients were recorded in Patan district. Head and Neck Cancers constituted 47.42% of total cancer in males. Cancer sites associated with tobacco form 60.97% of all cancers in men. Top five cancers in males in this study were tongue, lung, mouth, hypopharynx and larynx. During the year 2011, 85.95% cases were confirmed through primary histology reports. About 60.81% of deaths occurred in 35-64 years of broad age group and 27.03% of deaths were occurred in 65+ years age group.

Conclusion: The tobacco related cancers represent the most preventable form of cancer in our society. Future research should be aimed at improving quality of data for early detection and prevention of

tobacco related cancers and head and neck cancers.

Key Words: Incidence Rate, Head and Neck Cancers, Tobacco Related Cancers, Method of Diagnosis, Mortality Rate.

Introduction:

Cancer is the second leading cause of death and disability worldwide, behind only heart disease¹. More people die from cancer every year than human immunodeficiency virus (HIV), tuberculosis and malaria combined¹⁻⁴. Contrary to about three decades ago when cancer was more prevalent in the developed world, the burden is shifting significantly to the developing countries. According to estimates by the International Agency for Research on Cancer (IARC), in 2008, 53% of the 12.7 million new cases of cancer and 63% of the 7.6 million cancer deaths occurred in developing countries³. Three decades earlier, developing countries accounted for a mere 15% of global cancer burden⁴. Cancer is among the ten leading causes of death in India (Central Bureau of Health Intelligence, 2006)⁵. The estimated incidence in the country is 800,000 cases and prevalence is about two million cases. About 25% increases is expected by the year 2015⁶.

Patan district is one of the 26 districts of Gujarat state in western India. This district is located in northern Gujarat and bounded by Banaskantha district in the north and northeast, Mehsana district in the east and southeast, Surendranagar district in the south and Kutch District in the west. The district occupies an area of 5742.19 km². The district had a population of 1,182,709 (male 612,100 and female

(570,609) as of 2001 Census. Patan District recorded increase of 14.16 % to its population compared to 1991⁷. Patan has an average literacy rate of 60.40%, slightly higher than the national average of 59.5%. Male literacy is 73.60% and female literacy is 46.30%.

There are no reports on cancer incidence in Patan district; therefore we aimed to get estimation of cancer in male population of Patan district in Gujarat.

Materials and Methods:

The Gujarat Cancer and Research Institute is the base institution for the data collection which caters comprehensive cancer care to a large number of cancer patients. Cancer Registration system of patan district covers more than 100 sources. The trained field staff visited various sources of registration in all government hospitals, private hospitals, nursing homes and diagnostic laboratories besides the base Institution (GCRI) and death registration units in defined area. They actively pursued and collected information on cancer cases reported. Trained staff filled the core form by direct interview with patient or relative at time of registration in GCRI everyday. The inclusion criteria for registration of cases is that patients who have lived in the defined areas of patan district for a minimum period of one year of first diagnosis of cancer. Every cancer death not traceable or not matched with registered cases in record files, with same year or with previous years, was labeled as an 'unmatched death' and the date of death was then taken as the date of first diagnosis, and was so registered in the corresponding year's data file as Death Certificate Only (DCO) cases. During the year 2011, 347 (73.52%) of incident cases were registered from GCRI and 125 (26.48%) were registered from other sources. Other sources can mainly divide into three groups; sources of Patan district, sources of Ahmedabad City and sources of outside Patan district.

Usually the sites lip, tongue, mouth, salivary gland, tonsil, oropharynx, nasopharynx, hypopharynx, pharynx, nose and sinus, larynx and thyroid are considered as head and neck cancers⁸.

Anatomical sites of cancer associated with use of tobacco are lip, tongue, mouth, pharynx, oropharynx, hypopharynx, tonsil, esophagus, larynx, lung and urinary bladder included in this study⁹. This study includes data collection, data entry, coding and analysis was as per the National Cancer Registry Programme, (ICMR)¹⁰. The sites of all cancers were classified on the basis of ICD-10 for site coding¹¹. Third Edition of the International Classification of Disease for Oncology is being used for morphology coding¹².

Only invasive cancers (5th digit morphology code 3 or 6) were reported. Benign tumors and in-situ cancers were not included for analysis. In this study, Crude Incidence Rate (CIR), Age Specific Incidence Rate (ASpR) and Age Adjusted Incidence Rate (AAR) are used for analysis. The CIR is calculated by dividing total number of new cases registered during a year by corresponding population of that year and multiplying the result by 100,000. Age Specific Incidence Rate refers to the rate obtained by dividing the total number of cancer cases by the corresponding estimated population in that age group and multiplying by 100,000. As age increases, the incidence of cancer also increases therefore with an increase in the median age of population the cancer incidence also increases in the community. In order to make rates comparable between two populations or countries, the five year age distribution of the world standard population is taken into account to obtain the age adjusted rates (AAR). Truncated Rate (TR) is the rate similar to AAR except that it is calculated for the truncated age group of 35-64 years of age. Cancer diagnosis is made by different methods viz. microscopic verification, radiology

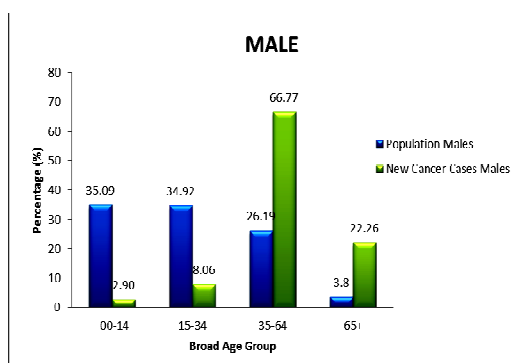
and imaging techniques, clinically, biochemical tests or by endoscopy.

However, a small proportion of cases (2.75%) were registered from the death registers of competent authorities as their incidence during life time could not be traced from any other source. Histological examinations of material obtained from primary site, from metastatic site, cytological diagnoses as well as hematological examinations were included in category of microscopic verification. Primary histology, secondary histology, cytology and bone marrow examinations were considered as detailed microscopic diagnosis in this study.

Results:

During the year 2011, 472 incident cases (310 males and 162 females) were registered in Patan district with Male/Female ratio was 1.91:1. The Crude Incidence Rate (CR) per 100,000 populations per year in male was 43.90. The corresponding Age Adjusted Rate (AAR) was 61.84. The Truncated Incidence rate (TR) in male was 128.17 per 100,000 persons. 2.90 % cases occurred in age group of 0-14 years, 8.06 % cases in 15-34 years, 66.77 % in the truncated age group of 35-64 years and 22.26 % in older age group (Figure:1).

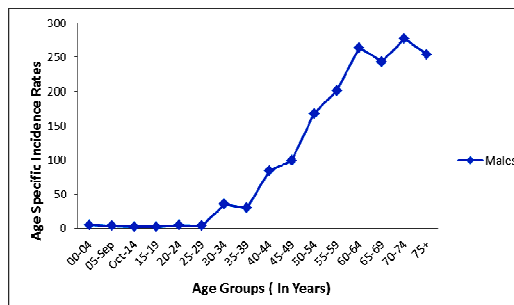
Fig. 1: Percentage of Population and Male Cancer cases by Broad Age groups PATAN District -2011



Cancer incidence rates were found to increase sharply with age for men. The age Specific Incidence Rates have crossed over 100 in 50-54 years age group and was

higher only between the ages 70-74 in males (Figure:2)

Fig. 2: Age specific incidence rate per 1,00,000 population with five years age groups by males PATAN District -2011.



A total of 147 cases of head and neck cancer were registered in Patan district during the year 2011, accounting for 47.42% of total cancer cases. Overall, the most common site was the tongue (29.93%), followed by the mouth (23.13%), hypopharynx (15.65%), larynx (10.2%), pharynx (8.16%), tonsil (5.44%), oropharynx (2.72%), thyroid (2.04%), salivary gland (1.36%). Cancer of nasopharynx and nose, sinus has equal proportion for head and neck cancer in males (Table: 1).

Table 1: Number and Percentage of Head and Neck cancers PATAN District- 2011

ICD Code	Site	Male	
		#	%
C01-02	Tongue	44	29.93
C03-06	Mouth	34	23.13
C07-08	Salivary Gland	2	1.36
C09	Tonsil	8	5.44
C10	Other Oropharynx	4	2.72
C11	Nasopharynx	1	0.68
C12-13	Hypopharynx	23	15.65
C14	Pharynx Unspecified	12	8.16
C30-31	Nose, Sinus	1	0.68
C32	Larynx	15	10.2
C73	Thyroid	3	2.04
Total		147	100
Proportion Of Head & Neck Cancers To Total Cancers In Either Sex (%)		310	47.42

Table 2: Number (#) and Percentage (%) of TRCs, PATAN District-2011.

ICD Code	SITE	MALE		
		#	(a)	(b)
C01-02	Tongue	44	23.28	14.19
C06	Oral Cavity	34	17.98	10.97
C09	Tonsil	8	4.23	2.58
C10	Oropharynx	4	2.12	1.29
C12-13	Hypopharynx	23	12.17	7.42
C14	Pharynx	12	6.35	3.87
C15	Oesophagus	12	6.35	3.87
C32	Larynx	15	7.94	4.84
C34	Lung	35	18.52	11.29
C67	Urinary Bladder	2	1.06	0.65
	T.R.C	189	100	60.97
	All types	310		100

Table: 2 shows the distribution of tobacco related cancers reported in Patan district. Tobacco Related Cancers (TRCs) accounted for 60.97% of all cancer in males. Among the tobacco related cancer sites in males, cancer of the tongue was the most common site (23.28%) followed by cancer of lung (18.52%) and oral cavity (17.98%). These three sites together constituted 59.78% of total TRCs.

Fig. 3: Five Leading Sites in Males, PATAN DISTRICT, 2011.

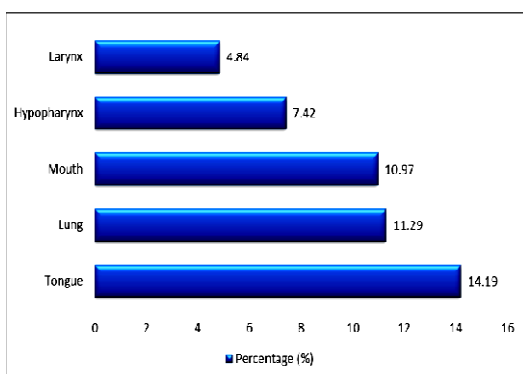
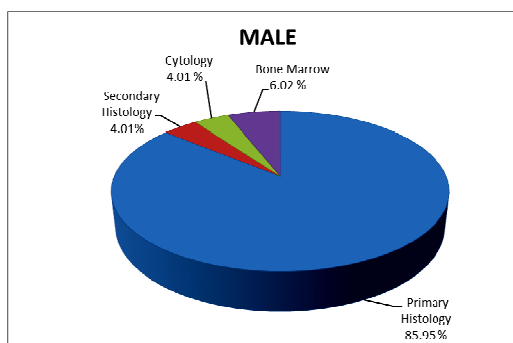


Figure: 3 represents the top five leading sites of cancers in males. Among top five leading sites of cancers, the site tongue (14.19%) ranks first followed by lung (11.29%), mouth (10.97%), hypopharynx (7.42%) and larynx (4.84%)

Graphical presentation of cancers by detailed microscopic diagnosis for males shows 85.95% cases are confirmed through primary histology type, 6.02% cases are through hematological examinations. Cancer cases diagnosed by detailed microscopic diagnosis like cytology and secondary histology type were having equal proportion of 4.01% (Figure: 4).

Fig. 4: Percentage of Distribution of Cancers by Detailed Microscopic Diagnosis and Males, PATAN District, 2011.



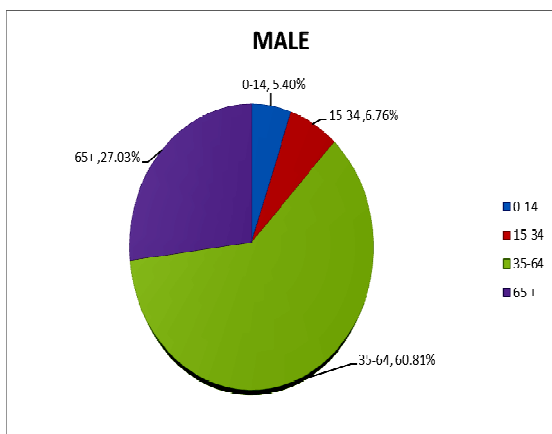
In the year 2011, 74 deaths were registered. Among total male deaths registered in Patan district, lung cancer (13.51%) was the top leading site followed by hypopharynx (9.46%). The Crude Mortality Rate (CMR) in male was 10.48 per 100,000 male populations per year. The corresponding Age Adjusted Mortality Rate (AAMR) was 15.19 per 100,000 male populations. The Truncated Mortality Rate (TMR) in male was 28.60 per 100,000 populations.

Table 3: Number (#) and Percentage (%) of Cancer Deaths with Broad Age Group by Males

Age Group (Years)	Male	
	#	%
0-14	4	5.40
15-34	5	6.76
35-64	45	60.81
65 +	20	27.03
Total	74	100

Mortality to incidence (M/I) ratio for all cancers in males was 23.87%. The highest mortality (60.81%) was found in truncated age group of 35-64 years in males (Table: 3). Figure: 5 shows the graphical distribution of cancer deaths with broad age group by males.

Fig. 5: Percentage (%) of Cancer Deaths with Broad Age Group by Males - PATAN DISTRICT 2011



Discussion:

The present study was a population based study which has covered Patan district of Gujarat. The result suggested that head and neck cancers and tobacco related cancers are the most preventable form of cancer in our society. Cancer of tongue, mouth and larynx are top three leading sites of cancers among head and neck cancers. The average age adjusted incidence rates for head and neck cancers in males varied from 46.1 in Barshi Registry to 116.2 for Delhi registry.⁽⁸⁾ There is strong epidemiological evidence to link tobacco habits with the occurrence of head and neck cancers. Head and neck cancers are the sixth most common malignancy and are a major cause of cancer morbidity and mortality worldwide. In India and South East Asia, oral cancer incidence accounts for up to 40% of all the malignancies¹³.

The three leading sites among all the tobacco related cancers were tongue, lung and oral cavity contributed 59.78% of all tobacco related cancers. Cancer of the

urinary bladder formed a small fraction of the tobacco related cancers in males. In males, the relative proportion of TRC ranged from 33.4% in Bangalore to 50.6% in Ahmedabad⁹. Each year in India an estimated total of 7-9 lakh new cancer cases are detected. Based on the estimation of National Cancer Registry Programme (NCRP), the number of newly diagnosed Tobacco Related Cancers each year in India has been approximately 2.5 lakh¹⁴. In present study, Tobacco related cancers constitute 61.29% of all cancers in males. Based on Cancer statistics provided by the population based cancer registries (henceforth called as PBCR), the proportion of TRCs among men ranged from 33.4% to 50.6%⁹. India is the second largest consumer of tobacco products and third largest producer of tobacco in the world.⁽¹⁵⁾ More than one-third of adults in India use tobacco in some form or the other. More than 75% of tobacco users, both smokers as well as smokeless tobacco users are daily users of tobacco and their mean age at initiation (for age group 20-34 years) is 17.8 years¹⁵. Various studies have demonstrated that tobacco use among school going children in India is very high^{16,17,18}. India global youth tobacco survey, 2006 confirmed the high prevalence of tobacco usage in school going children (among 13-15 years)¹⁹. This is an alarming trend towards increased tobacco use in India. Coupled with the fact that India is a second most populous country in the world, this trend will escalate the burden of Tobacco related Cancers in India and the resultant increase in global burden as well. The situation calls for urgent action, taking into consideration its implications on public health including the massive health-cost burden. The silver line is that tobacco related cancers are amenable to primary prevention (by control of tobacco consumption they represent the most preventable form of cancer) and secondary prevention (as most of the TRCs occur in most easily accessible anatomical parts,

thus, rendering its early and easy detection.).

The study findings amply revealed the higher proportion of head and neck cancers and tobacco related cancers among men.

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