

Incidence of Carcinoma of the Oral Cavity in Karachi - District South

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Abstract

Globally oral cancer is one of the ten common cancers. In some parts of the world, including the Indian sub-continent oral cancer is a major problem. The two year data of the Karachi Cancer Registry, showed oral cancer was the second most common malignancy in the males as well as in the females. The most common malignancy amongst the males being the carcinoma of the lungs and amongst the females, carcinoma of the breast. The annual incidence rate of oral cancer was 4.1 per 100,000 annually for the males and 4.0 per 100,000 annually for the females (JPMA 48:321, 1998).

Introduction

The “Karachi Cancer Registry” is the first population-based cancer registry of Pakistan. Established in January 1995, by the Government of Sindh, in collaboration with the International Agency for Research on Cancer, WHO, this active registry has completed 3 years of data collection. The registry staff collect cancer data of Karachi - District South, from various diagnostic and treatment centres within the district as well as centres outside the district where the cancer cases of District South are likely to go for diagnosis and treatment. The District South of Karachi has seven sub-divisions. It extends from the City Sub-division comprising of Lyari and adjoining areas to the Saddar Sub-division which has the Defence Housing Society as its main locality. Other localities in the latter sub-division are Mehmoodabad and parts of Saddar. The other five sub-division of District South are Garden, Eidgah, Arambagh and Civil Lines. District South of Karachi has the distinction of being the only district in the country with a representation of all ethnic and socio-economic groups of the country. It can thus be taken as a sample population of the country in the absence of a nation-wide registration system. Incidence is the total number of new cases in a defined time period for a specific population at risk. In the absence of population data, the incidence of a disease cannot be calculated. As such the data of Karachi Cancer Registry comes as the first incidence data in the country, as it is a population-based data.

Patients and Methods

The data of the cancer patients, residents of Karachi - District South was collected from the diagnostic and treatment centres of the district as well as from hospitals outside the district, where the Karachi-District South cancer patients were likely to go for diagnosis and treatment. The main sources of information to the registry were hospitals and cancer centres. Within the hospitals the main sources of data were the pathology laboratories and the medical records department. Out-patient departments, autopsy services and death certificates were not a helpful source of data.

The two most important hospitals in the District South were the Jinnah Postgraduate Medical Centre and the Civil Hospital, Karachi along with the Lyari General Hospital. The Aga Khan University Hospital, Liaquat National Hospital and Baqai Institute of Oncology are three important hospitals

outside the district which were important sources of data. Smaller hospitals within the district served as a primary source of data. Each case had a minimum of two to three reporting centres. This improved the validity of the data but proved a problem till canreg-2 was designed for the registry use, preventing recounting of the same cases.

The registry staff, actively visited the hospitals and treatment centres either getting computerised or data from the hospital records. Most of the times the patients were directly interviewed as organised data was not available at most centres. This is termed active reporting. In contrast passive or self-reporting relies upon health care workers or hospital staff to complete notifications and forward them to the registry. The former system is more prevalent in the developing countries, whereas the latter is the trend in the organised health care system of the developed countries.

People residing in the district for more than six months prior to the onset of the malignancy were considered "residents". All the cases diagnosed on or after 1st January, 1995 till 31st December, 1996 were considered for analysis. The data of the cancer patients for the years 1995-96 was computerised and analysed using the Camreg-2 computer program, prepared for the registry at the International Agency for Research on Cancer. The canreg-2 is programmed to check for duplication, thus preventing an exaggeration of the actual incidence. It also has EPI-5 incorporated for analysis.

The population, 2.85 million was estimated on the basis of the 1981 census, allowing for a 5% annual increase. Unofficial figures however estimated 3.5 million to be closer to the correct figure. The males were estimated to be 51% and the females 49% of the total population. The estimate of the population covered by the cancer registry was prepared for 1995. The calculation was based on the assumption that the population structure of Karachi South 2.85 million was similar to the population structure of Pakistan as estimated by the UN for the year 1995. Once the true figures of the 1998 census are declared the registry will be able to give more precise incidence rates.

Results

Squamous cell carcinoma of the oral cavity was the second most common cancer in Karachi District South with an annual incidence of 4.1/100,000 in males and 4.0/100,000 in females. A total of 233 (9.0%) cases were reported for the years 1995-96. One hundred twenty-two (52.4%) of the cancers were seen in males and 111 (47.6%) females. The male/female ratio was 1.1:1 (Table I).

Table I. Squamous cell carcinoma of the oral cavity (Age groups).

Sex	0-9	10-19	20-29	30-39	40-49	50-59	60-69	70-79	Total
Males	-	-	4	20	26	22	34	16	122 (15.4%)
Females	-	1	7	9	26	35	18	15	111 (47.6%)
Total	-	1	11	29	52	57	52	31	233 (100.0%)

There was a uniform age distribution of squamous cell carcinoma in the males, with a nearly equal proportion of cases in the fourth, fifth, sixth and seventh decades. In the females, 60 (54.1%) cases were in the fifth and sixth decades of life.

The malignancy was predominant amongst the Mohajirs and Baiochs. The Mohajirs having 29.6% and the Balochs 17.2% of the total. A high odds ratio of 2.0 was seen for Balochs (Tables II and III).

Table II. Squamous cell carcinoma of the oral cavity (Ethnicity).

Ethnicity	Males		Females		Total	
	No.	%	No.	%	No.	%
Sindhi	9	7.4	11	9.9	20	8.6
Punjabi	9	7.4	10	9.0	19	8.2
Pushtu	7	5.7	3	2.7	10	4.3
Baluch	18	14.8	22	19.8	40	17.2
Mohajir	40	32.8	29	26.1	69	29.6
Others	0	0.0	1	0.9	1	0.4
Unknown	39	32.0	35	31.5	74	31.8
Total	122	100.0	111	100.0	233	100.0

Table III. Squamous cell carcinoma of the oral cavity (odds ratio-ethnicity).

Ethnicity	Controls	Cases	Total	Odds ratio
Sindhi	166	20	186	1.2
Punjabi	265	19	284	0.7
Pushtu	137	10	147	0.7
Baluch	204	40	244	2.0
Mohajir (Urdu)	423	33	456	0.8
Mohajir (Gujrati)	119	13	132	1.1
Mohajir (Memoni)	187	23	210	1.2
Others	31	1	32	0.3
Unknown	827	74	901	0.9
Total	2359	233	2592	

Chi square= 24.58

Degrees of freedom=8

p value= 0.00183065

An odds ratio of 1.0 was seen in Muslims, but for the other religions in the district, viz, the Hindus, Christians and Parsis the odds ratio was less than 1.0 (Table IV).

No case was reported in Stage I. Fifty nine (25.3%) cases were seen in stage II and 78(33.5%) in stage III. Only 7(3.0%) cases were seen in stage IV.

Table IV. Squamous cell carcinoma of the oral cavity (Odds ratio- religion).

Religion	Controls	Cases	Total	Odds ratio
Muslims	2254	225	2479	1.0
Christians	46	2	48	0.4
Hindus	39	5	44	0.6
Parsis	5	0	5	-
Others	1	0	1	-
Unknown	14	1	15	0.7
Total	2359	233	2592	

In 89 (38.2%) cases the staging was not done by the clinicians reporting the cases (Table V).

Table V. Squamous cell carcinoma of the oral cavity (stage).

Stage	Males		Females		Total	
	No.	%	No.	%	No.	%
1	0	0.0	0	0.0	0	0.0
2	31	25.4	28	25.2	59	25.3
3	39	32.0	39	35.1	78	33.5
4	5	4.1	2	1.8	7	3.0
9	47	38.5	42	37.9	89	38.2
Total	122	100.0	111	100.0	233	100.0

Out of the total of 233 cases, 10 males and 4 females either opted out of treatment or were treated only symptomatically due to advanced disease. Curative surgery was possible in 49 (21,0%) cases, out of which 23 (18.9%) were males and 26 (23.4%) were females. Diagnostic biopsy with radiotherapy as treatment was done in 52 (22.3%) of the cases. Curative surgery was not possible in these cases. Chemotherapy alone was done in 5 cases (2. 1%). Curative or partial surgery in combination with radiotherapy was done in 53 (22.7%) cases. Other combination therapies like surgery and chemotherapy, radiotherapy and chemotherapy; surgery, radiotherapy and chemotherapy were done in 4 (1.4%), 11 (1,7%) and 16 (6.9%) of the cases. In 29(12.4%) cases the treatment was not known (Table VI).

Table VI. Squamous cell carcinoma of the oral cavity (treatment).

Treatment	Males		Females		Total	
	No.	%	No.	%	No.	%
No treatment	10	8.2	4	3.6	14	6.0
Surgery (s)	23	18.9	26	23.4	49	21.0
Radiotherapy (R)	26	21.3	26	23.4	52	22.3
Chemotherapy (C)	1	0.8	4	3.6	5	2.1
S+R	27	22.1	26	23.4	53	22.7
S+C	3	2.5	1	0.9	4	1.4
R+C	8	6.6	3	2.7	11	1.7
S+R+C	4	3.3	12	10.8	16	6.9
Unknown	20	16.4	9	8.1	29	12.4
Total	122	100.0	111	100.0	233	100.0

This is the first attempt of the registry to define the incidence of oral cancer. A missing rate of 20-30% is therefore probable. This should not be considered unusual in the early stage of registries as all sources of data are not defined. Re-analysis of the data over the next few years will hopefully reduce this rate.

Discussion

The aetiology of squamous cell carcinoma of the oral cavity is generally accepted to be multifactorial. Tobacco and alcohol are established as important cofactors in malignant development in the oral cavity, but in addition micro—organisms, such as human papillomavirus (HPV), have gained much interest over the past decade¹. A high prevalence of HCV infection in oral cancer patients is also seen². In Karachi one would assume with some degree of certainty that the high incidence of oral cancer would be a result of tobacco chewing, betel quid chewing, cigarette smoking and synergism between these factors.

The data of the Karachi Cancer Registry showed carcinoma of the oral cavity as the second most common malignancy in the city. A multicentric study conducted by the Pakistan Medical and Research Centre in 1982 reported oral cancer as the second most common malignancy in Pakistan³. A frequency study from Karachi published in 1983 put oral cancer as the third most common malignancy for the males and the second most common malignancy for the females⁴. A frequency study of patients attending the Institute of Radiotherapy and Nuclear Medicine (IRNUM), Peshawar, during 1990- 1994 showed that the third most common male tumour was oral cancer⁵.

The data of the Karachi Cancer Registry shows that the oral cancer constituted 9.8% of all the malignancies in Karachi South. The PMRC multicentric study reported that oral cancers constituted 10% of all malignancies in Pakistan whereas 20% of all the cancer patients coming to the radiotherapy department, JPMC, suffered from oral cancer^{6,7}. Thus it is indicated that cancer dynamics have changed little during the last 15 years and that oral cancer despite being preventable remains as one of

the most common malignancies of the country.

The 'Oral Carcinoma Research Project' JPMC, gave a prevalence rate of 50/100,000. The commonest age group involved by carcinoma was the 50-54 years age group. Thirteen percent of the cases were below the age of 40 years and 0.5% of the cases were below the age of 20 years⁸. Oral cancer is one of the most common cancers in the world, with a marked variation in the geographical incidence. In India oral cancer is the number one malignancy amongst the males and the number three amongst the females⁹. The Ahmedabad, Bangalore and the Bombay Cancer Registries show an annual incidence rate of 12.2, 4.32 and 7.8 per 100,000 for males and 3.94, 6.1 and 4.13 per 100,000 for females. A higher incidence is seen in case of males.

Cancer of the oral cavity remains a problem even for the developed countries, incidence and mortality for oral cancers have been reported to be increasing in Europe and the United States, such increases have been noted to be birth cohort-based. The Oxford, New York and Washington Cancer Registries have reported an annual incidence rate of 4.17, 10.3 and 8.9 per 100,000 for males and 2.4, 4.3 and 4.7 per 100,000 for females¹⁰. The Beimt Medical Centre Tumour Registry has however reported a dramatic decrease in oral cancer¹¹. In Europe the lowest incidence was reported in the Federal Republic of Germany (1%), Scandinavian countries (2%), England (3%), Italy and France (4%) and Ireland (5%)¹². The rise in oral cancer is seen despite the fact that the evolution of malignancies of the squamous epithelium go through progressive stages over periods of several years before becoming overt cancers. During the pre-malignant stages the disease remains easily detectable, preventable and curable.

Cancer is the second leading cause of death in the United States after cardiovascular diseases. Cancer of the oral cavity and pharynx account for approximately 2.5% of all cancer cases. Data over a 13 year period, collected from the Case Western Reserve University Oral Pathology Laboratory showed 222 cases of squamous cell carcinoma. The results indicated that the typical male patient was 7 years younger than the female patient. Apart from the use of alcohol and tobacco, the wearing of removable prostheses was associated with an increased rate of malignancy¹³.

A study on oral cancer in the United Kingdom showed that the malignancy occurred mainly in the seventh decade of life, women were on average 5 years younger than men at presentation. Men were affected 1.7 times as often as women and presented with more advanced disease than women. The majority of patients consumed alcohol and smoked tobacco, but a significant minority were lifelong non-drinkers¹⁴.

In Greece, 1979-1989, peak age of incidence was found to be the 6th decade for men and 8th decade for women. 98.5% of the patients were in stages I and II and 7.59% were in stage III. Primary surgical excision was done on 60.14%, radiotherapy on 35.1%, a combination of these on 2.47%, chemotherapy alone or in combination with the above regimens in 2.22%¹⁵.

In our study the average male patient was at least a decade younger than the female patient. The malignancy occurred in the fifth and the sixth decade of life i.e., the patients were a decade younger than the average patient in the developed countries and the male/female ratio was 1.1:1. The males were slightly more affected than the females. As the patients were younger than the patients of the developed countries, the association with removable prosthesis was unlikely. Primary surgery was possible in only 21.0%, radiotherapy in 22.3%, a combination of these in 22.7% and chemotherapy alone or in combination with the above regimens in case of 12.1%.

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