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Brief Communication

Lip and oral cavity cancers (C00-C06) from a mega city of Pakistan: Ten-year data from the Dow Cancer Registry

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Abstract

Objective: The objective of this report is to provide an overview of lip and oral cavity cancer in Karachi, the largest city in Pakistan.

Methods: This study was undertaken at the Dow Cancer Registry. During 2010–2019, all patients who were residents of Karachi who had been diagnosed with lip and oral cavity cancer were registered and recruited for this study. The data were entered in SPSS and MS Excel sheets to investigate frequencies, age-standardized-rates (ASR) and other clinicopathological parameters. The data from our study were compared with the ASR of lip and oral cavity cancer from selected Asian countries.

Results: During the defined period, 22,858 cancer cases were registered. Of these, 4,400 (19.2%, ASR 28.0) were lip and oral cavity cancer (the most common type found in males and the second most common type in females), of which 2,986 (67.8%) were found in males, while 1,414 (32.1%) were reported in females. Squamous cell carcinoma was the most common type (97.7%). Most tumours were moderately differentiated (67.7%) followed by poorly (16.6%), and well differentiated (15.7%).

Conclusion: We report an alarmingly high ASR of lip and oral cavity cancer in Karachi as compared to Pakistan as a whole and other Asian countries.

Keywords: Head and neck cancer; Oral cancer; Oral cavity; Oral squamous cell carcinoma; Pakistan

Introduction

According to Globocan 2018, lip and oral cavity cancer are the second most common malignancy for females while the commonest malignancy in males in Pakistan.[1] However, it is important to note that the Globocan 2018 data for cancer patients in Pakistan are largely extracted from a single source, namely the 'Punjab Cancer Registry' which does not truly represent the oral cancer burden in Karachi (and other parts of Pakistan); a city with reportedly a very high consumption of tobacco in various forms and a high burden of oral cancer reported for selected districts.[2,3] Moreover, it is important to note that there is no meaningful national scale cancer registration system functional in Pakistan. As a result, an estimation of the cancer burden in various regions of the country is largely dependent on the generation of regional cancer statistics

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generated by well-structured/reputable regional cancer registries. Within this context, it is highly relevant to report good quality regional cancer data to delineate the true burden of various types of cancer (including lip and oral cavity cancer) representing all districts of Karachi.

Importantly, the data detailing the incidence and clinicopathological features of oral cancer in Karachi are weak. This study was thus designed to investigate the burden of lip and oral cavity cancer in Karachi. We herewith present the incidence of lip and oral cavity cancer (C00–C06) in Karachi over a period of 10 years (2010–2019) using data sourced from the Dow Cancer Registry (DCR) which operates in Dow Labs (the largest governmental reference and diagnostic laboratory in Karachi).[4] The DCR regularly publishes cancer statistics from Karachi and registers cancer patients via 34 collection points of Dow Labs which are distributed throughout the city of Karachi. The DCR data are therefore very high quality and represent all geographical districts of the city. More recently, the DCR published the overall cancer burden in the city of Karachi from 2010 to 2019.[5] Although the data presented herein have been extracted from the DCR the focus is on detailing the clinic pathological features of lip and oral cavity cancer in Karachi.

Our findings are highly significant and contribute towards identifying Karachi-wide incidence of oral cancer. Moreover, our data have the potential to impact/facilitate relevant authorities and government functionaries to formulate appropriate strategies related to the control and prevention of oral cancer in Pakistan.

Materials and Methods

Cancer registrations at the DCR were sourced from Dow Labs, which collect cancer specimens from around the city via 34 collection points in Karachi.[4,5]

All patients who were residents of Karachi and had been diagnosed with histologically confirmed lip and oral cavity cancer were included in the study. Any duplicate entry or patients without histologically confirmed diagnoses were excluded. Collection of data and data indexation was performed as already reported.[4,5] All cancer diagnoses were confirmed via histopathology and coded as per ICD10 coding guidelines. All data were indexed initially using MS Excel as well as SPSS. Data on lip and oral cavity cancer (C00–C06) registered during 2010–2019 were extracted from the registry to describe frequencies and age-standardized rates (ASR), calculated using an age-specific population projected by the census 1998 data published by the Pakistan Bureau of Statistics incorporating a 3.5% inter-census growth rate and other clinicopathological parameters such as tumour morphology and grade.[6] We further compared our findings with cancer registries of selected Asian countries.

Results

During 2010–2019, 22,858 cases of cancer were indexed at the DCR. Of these, 4,400 were diagnosed as lip and oral cavity cancer which was the most common malignancy in males and the second most common recorded malignancy in females. The clinicopathological parameters of diagnosed cancer cases are listed in Table 1.

Of the 4,400 cases of lip and oral cavity cancer, 2,986 (67.8%) were diagnosed in males and 1,414 (32.2%) in females, showing a male to female ratio of 1.8. The frequency based on age and ASR is listed in Table 2.

All diagnoses were made on histopathology. The mean age for males and females was 47.2 and 50.6 years, respectively. Histologically, 2,984 (67.7%) tumours were moderately differentiated, 726 (16.6%) poorly differentiated, and 690 (15.7%) well differentiated. Squamous cell carcinoma (97.7%) was the most common cancer type followed by adenocarcinoma (0.7%).

We also compared ASR (excluding non-melanoma skin cancer) of lip and oral cavity cancer in Karachi with a selected population from Asia (Figure 1). Significantly, our

Table 1: Clinicopathological parameters of lip and oral cavity cancer in Karachi.

Parameter	n = 4,400
Frequency	
Males	2,986 (67.8%)
Females	1,414 (32.2%)
Gender ratio (M/F)	1.8
Basis of diagnosis	
Clinical	0%
Histological	100%
Grade	
Well differentiated	690 (15.7%)
Moderately differentiated	2,984 (67.7%)
Poorly differentiated	726 (16.6)
Mean age	
Males	47.2 years
Females	50.6 years
Morphology	
Squamous cell carcinoma	4,299 (97.7%)
Adenocarcinoma	29 (0.7%)
Other specified carcinoma	72 (1.6%)

Table 2: Lip and oral cavity cancer in Karachi: 2010–2019 ASR in males and females.

Gender	0–14	15–24	25–34	35–44	45–54	55–64	65–74	75+	Total	ASR	ASR world*
Male	8 (0.3)	52 (2.8)	425 (30.3)	756 (78.3)	839 (132.4)	583 (167.7)	247 (146.4)	76 (117.8)	2,986	35.4	5.8
Female	4 (0.1)	30 (1.9)	132 (12.0)	268 (34.3)	417 (83.4)	346 (122.5)	145 (109.4)	72 (125.4)	1,414	19.2	2.3
Total	12	82	557	1,024	1,256	929	392	148	4,400	28.0	4.0

* = ASR world data as reported in Globocan 2018.[1]

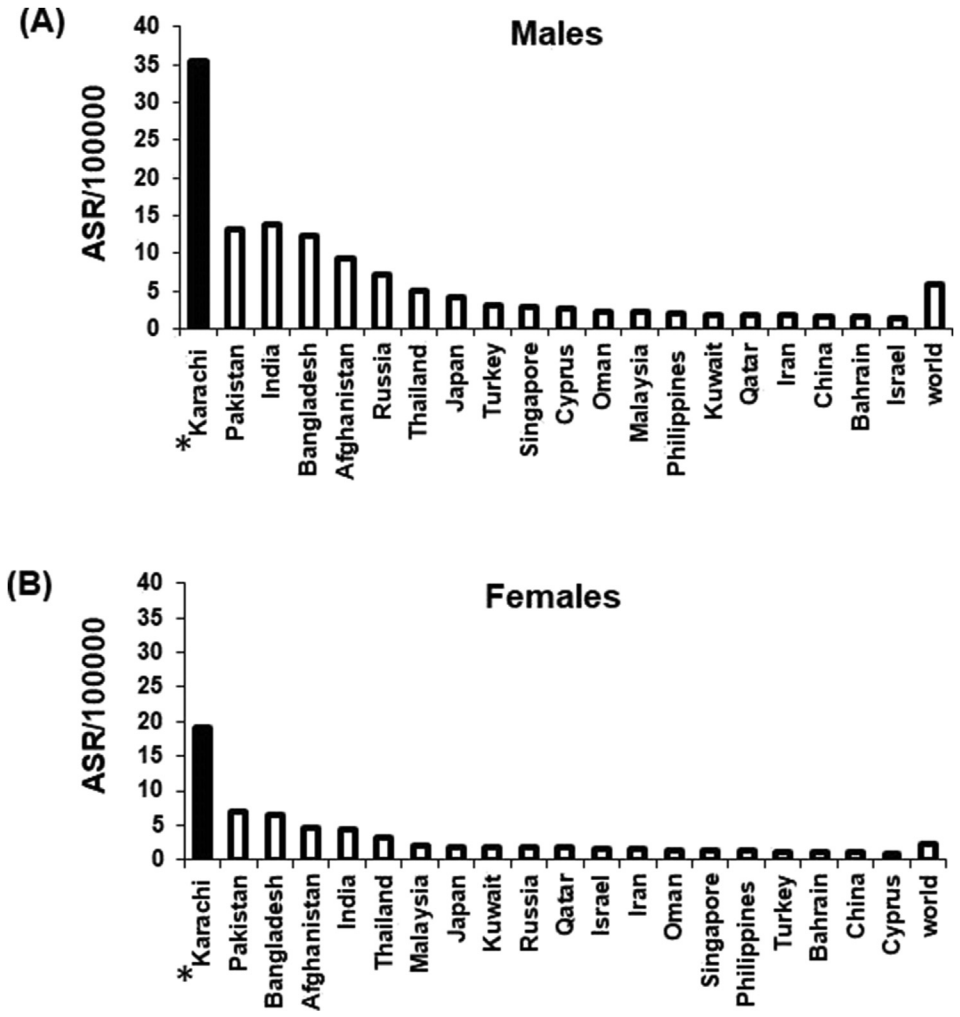

Figure 1: Comparison of ASR of lip and oral cavity cancer (A = Males, B=Females) between Karachi and a selected Asian population. (* = ASR for Karachi has been taken from the present study. For all other countries (including Pakistan), ASR data have been extracted from the Globocan 2018 report).[1]

data highlight that ASR of lip and oral cavity cancer in males from Karachi is the highest when compared to any other male population in Asia.

Discussion

In this report, we present the incidence of lip and oral cavity cancer in Karachi during 2010–2019 and found that this type of cancer had the most common malignancy in males and the second most common cancer in females. The increased burden of lip and oral cavity cancer has also been published by various other local cancer registries of Pakistan.[7–9] While Globocan 2018 documents similar patterns, incidence is much lower compared to our study, possibly because the cancer data from Globocan 2018 detailing cancer statistics for Pakistan are largely extracted from a single source, that is, the Punjab Cancer Registry and are therefore not representative of the cancer burden in Karachi – a city where tobacco consumption in its various forms is very high.[3]

We alarmingly report that the ASR of lip and oral cavity cancer is highest in Karachi males compared to any other male Asian population. There could be several plausible reasons to explain such a high burden of this type of cancer in Karachi males. For example, it has been observed that males, particularly those with a lower socioeconomic status, consume more tobacco products compared to females.[10] The various forms of tobacco used in Karachi include (i) smoking, such as cigarettes, *bidi* (dried and rolled tobacco leaves), *shisha* (tobacco with fragrant liquid) and, (ii) chewing smokeless tobacco including *paan* (betel-quids), beetle-nuts, *naswar* (powdered moist tobacco which is kept in the base of oral cavity or alongside teeth between the cheek and mandible for a long time), and *gutka* (a mixture of paraffin wax, areca nuts, lime, catechu, and tobacco). In Karachi, the use of smokeless tobacco (*naswar* and *gutka*) is particularly high compared to other parts of the country.[3] Both are chewed and kept in the mouth for long periods of time resulting in increased contact time of chemicals with buccal mucosa leading to chronic inflammation and thus a higher probability of submucosal fibrosis and oral cancer.[11] It is also important to note that residents of Karachi have limited/poor knowledge regarding the harmful effects of tobacco use.[12]

It must be noted that the burden of lip and oral cavity cancer is higher in Karachi compared to Pakistan ASR as reported by Globocan 2018. Importantly, the ASR described by Globocan 2018 for Pakistan are largely taken from the Punjab Cancer Registry. A plausible explanation for the higher burden of this cancer in Karachi is the very high usage of tobacco associated products in Karachi compared to any other part of Pakistan.[3]

What is significant is that lip and oral cavity cancer is largely preventable if relevant legislation was created and implemented in Pakistan to ban the use of tobacco products. It is thus crucial that the Pakistani government and other relevant authorities consider ways to control/ban the use of tobacco. We also recommend that relevant authorities allocate an appropriate health care budget for the diagnosis and treatment of lip and oral cavity cancer so that this highly common malignancy can be addressed accordingly. Moreover, policies regarding minimizing the use of tobacco and its products and increasing awareness of the general public regarding the hazards of tobacco usage could play a vital role in controlling oral cancer in Karachi. In addition, cancer researchers in Karachi should focus on investigating lip and oral cavity cancer to devise novel diagnostic, therapeutic, and prognostic strategies. This would require facilitation and monitoring by international organizations such as the UICC and the IARC.

Conclusions

Our data highlight that Karachi males have the highest ASR of lip and oral cavity cancer compared to any other similar Asian population.

Recommendations

This report calls on health officials/departments to ban or control the consumption of tobacco. Moreover, public awareness should be increased regarding hazardous effects of tobacco usage. Serious action should be taken by the relevant government authorities.

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Conflict of interest

The authors have no conflict of interest to declare.

Ethical approval

All procedures were performed in line with the ethical standards of the institutional research committee and conform with the 1964 Helsinki Declaration and its later amendments or comparable ethical standards.

The study was conducted at the Dow Cancer Registry of the Dow University of Health Sciences (DUHS) after obtaining ethical approval from the Institutional Review Board of the DUHS (approval reference number: IRB-459/DUHS/-14, renewed # IRB-1667/DUHS/Approval/2020).

Authors contribution

MAQ, founding in charge of the Dow Cancer Registry, conceived and designed the study, archived and indexed the data, ran the data analyses, drafted the manuscript, and managed correspondence with journal. **SAS** performed data indexation, manuscript drafting, and data analyses. **SS** contributed towards data analyses, manuscript drafting, and facilitating the implementation of the project. All authors have critically reviewed and approved the final draft and are equally responsible for the manuscript's content and similarity index.

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