

# Geographic mapping of head and neck cancers in Nanded, Maharashtra, India: A hospital based study

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## Abstract

**Background:** Head and neck cancers are most common in developing countries. It is the most common cancer of males in India and fifth in females. India is classified as a lower middle income group country by World Bank. Nanded, Maharashtra, India is a district place where this government medical college and hospital is situated; this is a tertiary medical care centre and caters nearby districts like Parbhani, Hingoli, Yavatmal and Adilabad. **Methods:** This is cross sectional study of 18 months. Cases are selected with superficially palpable head and neck lesions referred to Cytology OPD, and hospital ward with clinical diagnosis of any head and neck neoplastic lesions. An FNAC smear in the Cytology section of CCL and in ward finally the microscopic verification is done by biopsies with histopathological confirmation is done and confirmed cases are included in this study. Geographical mapping done by making the master chart of patient's permanent addresses. Patients categorized as per codes by NCRP used for Atlas of cancer of India. **Results:** Relative proportion percentage of head and neck cancers is 88.33 were from Nanded district, followed by Hingoli, Parbhani, Yavatmal from Maharashtra state and Adilabad districts from Telangana state. **Conclusions:** This centre caters more than five districts including Maharashtra and Telangana state, in this hospital based 'head and neck cancer registry' of microscopically confirmed cancers, maximum cases are from Nanded district. This institute does not cover the geographic area mentioned in the literature of highest and lowest relative proportion percentage of head and neck cancers.

**Key words:** Cancer Registry, District Data, Geographic Pathology, Head and Neck Cancers.

## Introduction

Head and neck cancers form only 1-4% of all cancers in the western world and are common cancers in South and East Asian countries. Oral cancers are most predominant form of head and neck squamous cell carcinomas in India, Pakistan, and South East Asian countries. Oropharyngeal and tongue cancers are common in western world. Head and neck cancers are most common cancers in developing countries. It is most common cancer of males in India and fifth in females [1].

Europe and United States of America reports of head and neck cancers are increasing among the young particularly in tongue. Oral cancers formed the majority

of head and neck cancers with predilection for tongue except in rural males in whom pharynx was predominant sub site. Incidence of head and neck squamous cell carcinomas are reducing and is attributed to decrease in the prevalence of tobacco use. The increase in incidence of tongue cancers may suggest factors other than tobacco and alcohol in genesis [2].

India is classified as a lower middle income group country by World Bank. Ninety per cent of oral cancer patients in rural India belong to the lower middle socioeconomic class and 36% are below poverty line. Indian Council of Medical Research has shown the incidence of various cancers in different parts of India (Table 1) [1], a pan India study of microscopically diagnosed cancers in 2001-2002 from 68 districts across

Manuscript received: 12<sup>th</sup> September 2016  
Reviewed: 25<sup>th</sup> September 2016  
Author Corrected: 10<sup>th</sup> October 2016  
Accepted for Publication: 25<sup>th</sup> October 2016

**Research Article**

India shown in (Table. 2) [4]. PBCR data shows MAAR is the highest for following topography sites (Table 3).

Nanded, Maharashtra, India is a district place where this government medical college and hospital is situated, this is a tertiary medical care centre, and this centre caters nearby districts like Parbhani, Hingoli, Yavatmal from Maharashtra state and Adilabad district from Telangana state. Nanded city is situated on the river side of Godavari is also called as 'dakshin ganga' previously it was a part of Nizam State.

Now this district is a part of Marathwada division of Maharashtra state of India. There is a famous Gurdwara of the 10<sup>th</sup> Guru of Sikh religion Shree Guru Gobind Singh Ji.

**Methods**

This is a tertiary care and the referral centre caters more than five districts including Maharashtra and Telangana state, as this activity belongs to hospital based head and neck cancer registry of microscopically confirmed cancers which are having highest accuracy of diagnosis.

The present study was undertaken in the department of Pathology, Government Medical College and Hospital, Nanded, India which is a leading histopathology laboratory in the city.

This is a prospective & cross-sectional study over the period of 18 months from January 2008 to June 2009. The inclusion criteria were as below.

**Results**

In the present study, the geographic mapping of cases of histopathologically confirmed head and neck malignancy was done, the maximum number of cases of head and neck cancers were from Nanded district (88.33%) followed by Hingoli, Parbhani, Yavatmal and Adilabad districts (Table 4).

**Table-1: Incidence of head and neck cancers in Indian scenario.**

Serial Number	District	State	Portion Of India	Site Involving cancer	Sex	Incidence per 100000 population	Remarks
1	Aizawl	Mizoram	North East	Lower Pharynx	Men	11.5	World's highest incidence
2				Tongue	Men	07.6	Highest incidence
3	Kohima	Nagaland		Nasopharyngeal cancers			World's highest incidence

1. Sample collection method was the patients collection presented with superficially palpable head and neck lesion referred to cytology OPD.

2. Also samples of patient's admitted in hospital ward of this institute with clinical diagnosis of any head and neck neoplastic lesions.

3. Above selected patients with head and neck lesions the FNAC smears were taken and cytologically positive patients referred for biopsy procedures.

4. Microscopic verification done by biopsy histopathology examination (HPE) so in this way the histopathological confirmation done on cytologically suspected cases for malignancies. These confirmed cases were included in present study.

5. Exclusion criteria were dropping the benign tumors and tumor like lesions from the Head and Neck Neoplastic Lesions.

Thus remaining the head and neck cancer cancers were included for geographical mapping, in which their permanent addresses are categorized as per codes mentioned in the reference quoted as similar type of study conducted by NCRP for Atlas of cancer of India [4]. All these cases in specified period were studied prospectively in the department of Pathology, Government Medical College and Hospital, Nanded, Maharashtra, India. Statistical method used was the district wise mapping done by calculating percentage of head and neck cancers in the hospital catering the districts in the Maharashtra state and nearby Telangana state.

**Table-2: Head and Neck cancers, highest incidence Geographical locations 2001-02 [4].**

Serial Number	States	Portion of India	Sex- Cancer Site
1	Aizawl	North East India	Males-Lower Pharynx
2	Mizoram		Males-Tongue
3	Kohima Nagaland		Males-Nasopharyngeal Cancers
4	Imphal Manipur		
5	Karnataka Tamil Nadu Kerala	Southern States in India	Males and Females-Mouth
6	Gujarat Goa Karnataka Kerala Sikkim Nagaland Manipur	South west coastal districts and North East India	Females-Thyroid cancers

**Table-3: Leading Topographic sites in the region of Head and Neck cancers Population Based Cancer Registry Data [3].**

Sr No	Topographic sites as per ICD 10	Per100000 population	Gender	PBCR
1	Tongue C01-C02	10.0	Males	Bhopal
2	Mouth C03-C06	08.6		
3	Naso pharynx C11	00.7		
4	Thyroid C73	02.6	Females	Bengaluru

**Table-4: Geographic Mapping (district wise distribution) of Head and Neck cancers in histopathologically confirmed cases showing relative proportion percentage of cases [6].**

Sr No.	District	State	Geographic Area Code	Number	%
1	Nanded	Maharashtra State	2715	53	88.33
2	Hingoli		2716	02	03.33
3	Parbhani		2717	02	03.33
4	Yavatmal		2714	02	03.33
5	Adilabad	Telangana State	2801	01	01.68
6	TOTAL	Hospital Based Head & Neck Cancer Registry		60	100.0

**Table-5: Comparison of cancer cases in present study and previous study at the same institute [5].**

Sr No.	District.	State.	Geographic Area code.	'All Cancers' number in percentage in previous study. 2001-2002 [5].	'Head and Neck Cancers' percentage in present study 2008-2009.
1	Nanded	Maharashtra	2715	78.7	88.33
2	Hingoli		2716	06.7	03.33
3	Parbhani		2717	04.7	03.33
4	Yavatmal		2714	04.1	03.33
5	Adilabad	Telangana	2801	01.4	01.68
6	Other Districts		-	04.5	00.00
7	TOTAL	Hospital Based Cancer Registry		100.0	100.0

**Table-6: Comparisons of Head and Neck cancer geographic mapping in India and Internationally by AAR [4].**

Serial Number	Topography Site	Gender	INDIAN				All World PBCR Internationally	
			PBCR		Districts		Leading AAR	Lowest AAR
			Leading AAR	Lowest AAR	Leading AAR	Lowest AAR		
1	Tongue	Male	Bhopal	Barshi	Aizawl MZ	Imphal West MR	Bhopal India	Qi. County China
2	Mouth	Male			Wardha MH	Bhavnagar GJ		Singapore Malay
3	Mouth	Female			Kolar KA	Thrissur KL	Pakistan South Karachi	Qi. County China
4	Tonsil	Male			Darrang AS	Kancheepuram TN	Calvados France	Algiers Algeria
5	Oro pharynx	Male	Bengaluru	Barpeta AS	Dakshin Kannada KA	Costa Rica		
6	Naso pharynx	Male	Chennai	Mumbai	Kohima NL	Thane MH	Hong Kong China	Quito Ecuador
7	Hypo pharynx	Male	Bhopal	Delhi	Aizawl MZ	Chamrajnagar KA	Bas-Rhin Fran.	Bamako Mali
8	Pharynx	Male	Mumbai	Chennai	Anand GJ	Vadodara GJ	Somme France	Algiers Algeria
9	Larynx	Male	Delhi	Barshi	Imphal West MR	Villupuram TN	Spain Zaragoza	The Gambia
10	Thyroid	Female	Bengaluru		Imphal East MR	East Godavari AP	USA Filipino	Qi. County China

## Discussion

When compared with geographical data of same institute data of 'all cancers' is somewhat comparable [4]. The cases of head and neck cancers are more than all other cancers hence it may be stated that the incidence of head and neck cancers may be more than Nanded district, it may be emergence of head and neck cancers in Adilabad district of Telangana state in recent years .The data of head and neck cancers in the previous study is not available while the data of all cancers is available in relation with the same geographical area (Table 5).

In 82 districts pan India study of 2001-2002 highlights some topographic sites with gender showing highest incidence of geographical locations in India and internationally are in (Table 6) [4].

Bhopal, Bengaluru, Chennai, Mumbai and Delhi PBCR data is showing the highest incidence of head and neck cancers in which, Bhopal covers maximum topographic

sites in the region of head and neck include Males-Tongue, Males-Mouth, Males-Tonsil and Males-hypo pharynx, Females-Mouth, Bengaluru PBCR covers Male-Oropharynx Females-Thyroid, Chennai PBCR covers Males- Naso pharynx, Mumbai PBCR covers Males-Pharynx and Delhi PBCR covers Males-Larynx.

Internationally Bhopal PBCR is having highest incidence in the world in the topographic sites of Male-Tongue and Male-Mouth [4].

District wise data shows highest incidence in India, Aizawl MZ shows the topographic site Males-Tongue, and Male-Hypo pharynx, Imphal west MR the site is Male-Larynx, Imphal east MR the site is Female-Thyroid, Anand GJ the site is Male-Pharynx, Kohima NL the site is Male-Naso Pharynx, Barpeta AS the site is Male-Oropharynx, Darrang AS the site is Male-Tonsil, Kolar KA Female-Mouth and Wardha MH the site is Male- Mouth [4].

## Conclusions

This tertiary care referral centre caters more than five districts including Maharashtra and Telangana state, as this activity belongs to hospital based head and neck cancer registry of microscopically confirmed cancers which is having highest accuracy of diagnosis and maximum cases are from Nanded district of Maharashtra state which is followed by Hingoli district. Very small population of Telangana state by this tertiary care centre is covered. This institute does not cover any geographic area mentioned in the literature of highest and lowest proportion percentage of head and neck cancers [4] [6].

**Acknowledgements:** I sincerely express my thanks to my post graduate student Dr Amit U. Maniyar Green Cross Path Lab Ahmadabad who has created such data for his dissertation for M.D. (Pathology) (MUHS) (2010) and also express my thanks to Dr A. Nandakumar, NCRP Bengaluru, India, who has created 'An Atlas of Cancer of India' with the support of World Health Organization from whom I received an inspiration for this project.

## Abbreviations

- AAR** : Age Adjusted Rate/100000  
**CCL** : Central Clinical Laboratory  
**FNAC** : Fine Needle Aspiration Cytology  
**MAAR** : Microscopic Age Adjusted Rate/100000  
**NCRP** : National Cancer Registry Program  
**OPD** : Out Patient Department  
**PBCR** : Population Based Cancer Registry  
**WHO** : World Health Organization

## Declarations

**Funding:** Nil, **Conflict of interest:** None initiated,  
**Permission from IRB:** Yes

## How to cite this article?

Namdhari BH, Deshpande SA. Geographic mapping of head and neck cancers in Nanded, Maharashtra, India: A hospital based study. *Trop J Path Micro* 2016;2(3):99-103.doi: 10.17511/jopm.2016.i03.04

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