Original Research Article

Demographics and targeted biopsy with NBI in head and neck mucosal lesions

Pranay Bhandari*, Kavita Sachdeva

Department of ENT, Netaji Subhash Chandra Bose Medical College, Jabalpur, Madhya Pradesh, India

*Correspondence:
Dr. Pranay Bhandari,
E-mail: pgpbvds@gmail.com

ABSTRACT

Background: It is estimated that by the end of year 2020 over 10 million people worldwide would die of cancer every year and about 66% of these would be from developing world like India (WHO-UCC 2003). Our aim in present study was to evaluate the use of targeted biopsy of mucosal lesions of head and neck cancer using narrow band imaging technique, in order to yield more accurate specimen of lesion which will result in correct diagnosis of disease early and to study different demographics of patients.

Methods: Patients lesions were examined under NBI endoscope, best site of biopsy were identified on the basis of increase vascularity, neo-angiogenesis and superficial capillary vessels. Biopsy were taken from this site and sent for histopathological examinations. Considering histopathological report as standard, results from NBI endoscopy were compared to the results of previous studies and conclusion was done. We also studied different demographics of these patients under site of lesion, age distribution, sex distribution, and locality, histopathology type.

Results: Maximum lesions were found in oral cavity (56.33%). Malignancy was also more common in oral cavity (63.46%), mostly belong to squamous cell carcinoma on histopathology. Mean age of presentation of head and neck mucosal lesion was found to be 48 year and of malignant lesions is 54 years.

Conclusions: We conclude that up to an extent with progression of age malignant lesions increase. Male to female ratio of mucosal lesions is 1.7:1 and of malignancy is 2.25:1. Narrow band imaging endoscopy helps us to identify best site of biopsy, helping in early diagnosis of disease and ultimately reducing morbidity and mortality of patient.

Keywords: Demographics, Head and neck mucosal lesions, Narrow band imaging, Target biopsy

INTRODUCTION

Head and neck cancer include oral cavity and oro-pharyngeal cancers, nasopharyngeal cancers, and laryngeal and hypo-pharyngeal cancers.[1] It is estimated that by the end of year 2020 over 10 million people worldwide would die of cancer every year and about 66% of these would be from developing world like India (WHO-UCC 2003).[2] Globocan 2012, states incidence of head and neck cancer every year is about 683235/1000,000, the mortality is 375664/1000,000.[3] It is the sixth cause of cancer death throughout world. Over 200,000 cases of HNC occur each year in India. Nearly 80,000 oral cancers are diagnosed every year in our country.[4] In

India, HNC accounts for 30% of all cancers.[4] Takiar and Vijay (2012) studied the changes in the cancer pattern of men and women in India. In men they found that emerging new cancers in India are prostate, liver and mouth.[5]

Since day by day incidence of head and neck cancer is increasing, we need newer modalities which will detect these lesions early and accurately. Hence preserving precious time and diagnosing the disease in early period in order to reduce morbidity and mortality of disease. One of the techniques used now a day is narrow band imaging. Narrow band imaging is newer tool used around maximum parts of world for image enhanced endoscopy.[6]

NBI is based on the principle that it produces blue light, which has less penetration into tissue; hence it alters the colour of capillary network found on mucosal surfaces.[7] NBI can detect superficial lesion on the basis of increased vascularity and neo-angiogenesis of the tumour, which were missed by regular white light during endoscopy.[8]

Our aim in present study was to evaluate the use of targeted biopsy of mucosal lesions of head and neck cancer using narrow band imaging technique, in order to yield more accurate specimen of lesion which will result in correct diagnosis of disease early and to study different demographics of patients under the aspects of age, sex, locality and occupation who were enrolled in study.

METHODS

Study design

It was a prospective study.

Selection criteria

Inclusion criteria were all male and female patients of all ages who were suspected of having mucosal lesions of head and neck; or signs and symptoms suggestive of mucosal lesions of head and neck. Exclusion criteria were all patients suspected of having vascular tumours and those who refuse to consent.

Collection of data and statistical analysis

Patients were evaluated in Department of Otorhinolaryngology in NSCB Medical College, Jabalpur (Madhya Pradesh) in period from February 2017 to August 2018. 71 patients were included in study, followed by thorough examination and endoscopy of nose, oral cavity and larynx with 0-degree, 30-degree and 70-degree NBI endoscopes. After examination of these lesions under NBI endoscope best site of biopsy were identified on the basis of increase vascularity, neo-angiogenesis and superficial capillary vessels. Biopsy were taken from this site and sent for histopathological examinations.

Purposive sampling method was applied. Considering the best availability of the patients by reviewing the previous records of this health facility to achieve the maximum sample size we will screen patients who have fulfil the inclusion and exclusion criteria and ready to give the written informed consent. All the records were recorded by using structured schedule (case report form) and entered in Microsoft excel sheet. Considering histopathological report as standard, results from NBI endoscopy were compared to the results of previous studies and conclusion was done.

We also studied different demographics of these patients under site of lesion, age distribution, sex distribution, and locality.

RESULTS

Site of lesion

Out of 71 cases 40 cases were oral (56.33%), out of 40 cases 33 were malignant (82.5%), 2 were premalignant (5%) and 5 were benign (12.5%). 15 cases were nasal (21.12%), out of them 3 were malignant (20%), 11 cases (73.33%) were benign and 1 case was inflammatory (6.66%). 16 (22.53%) cases were laryngeal all of them were malignant (100%). Total 52 lesions were found to be malignant. Among them 44(84%) belong to be of squamous cell carcinoma on histopathology.
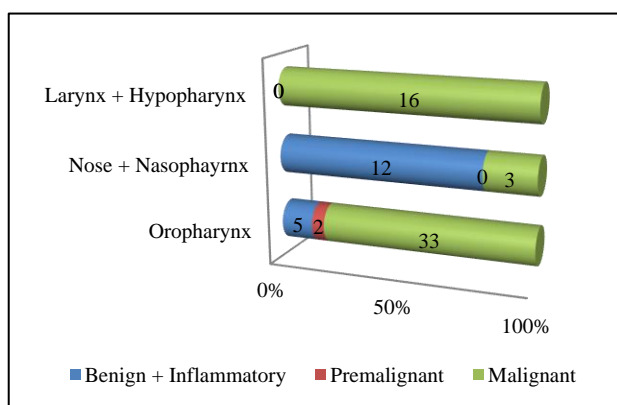

Figure 1: Site of lesion.

Age distribution

In age group up to 20 years, there are 5 cases (7.00%), out of them 4 cases were nasal while 1 case was oral. All of them were benign (100%). In age group 21-30 years there were 10 cases (14.1%), out of them 5 were oral (50%) and 5 nasal (50%). Out of 10 cases 4 were malignant (40%), 1 premalignant (10%), 4 benign (40%), 1 was inflammatory (10%). In age group between 31-40 years there were 13 cases (18.3%), out of them 10 were oral (76.92%), 1 nasal (7.6%) and 2 were laryngeal (15.3%). Out of 13 cases 10 were malignant (76.92%), 1 premalignant (7.6%), and 2 were benign (15.38%).

Table 1: Distribution of lesions according to age.

Age (in years)	Frequency	Percent
Upto 20	5	7.0
21-30	10	14.1
31-40	13	18.3
41-50	13	18.3
51-60	12	16.9
61-70	11	15.5
71-80	7	9.9
Total	71	100.0

In age group between 41-50 years there are 13 cases (18.3%). Out of 13 cases 9 were oral (69.23%), 1 nasal (7.6%) and 3 were laryngeal (23.07%). Out of 13 cases

11 were malignant (84.61%), 2 were benign (15.28%). In age group between 51-60 years there are 12 cases (16.9%). Out of 12 cases 3 cases were oral (25%), 4 were nasal (33.33%), 5 were laryngeal (41.6%). Out of 12 cases 2 were benign (16.66%) rest 10 cases were malignant (83.33%). In age group between 61-70 years there are 11 cases (15.5%). Out of 11 cases 8 were oral (72.72%), 3 were laryngeal (25%). Out of 11 cases 1 case was benign (9.09%), rest 10 cases (90.09) were malignant. In age group between 71-80 years there are 7 cases (9.9%). Out of 7 cases 4 were oral (57.1%), 3 were laryngeal (42.85%). All cases were malignant (100%).
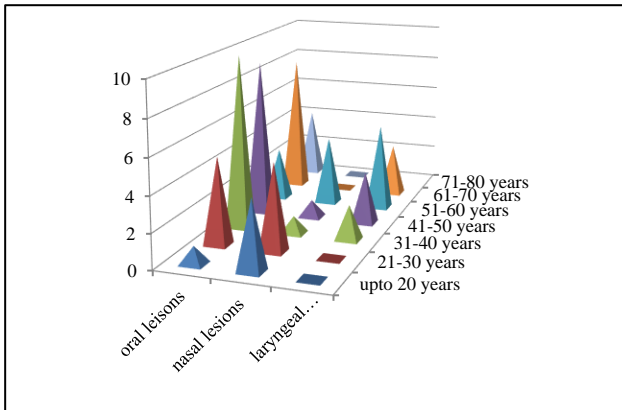

Figure 4: Male female ratio.

Figure 2: Distribution of oral, nasal and laryngeal lesions according to age.

Figure 5: Distribution of lesions according to sex.

Figure 3: Distribution of lesions on the basis HPR in different age groups.
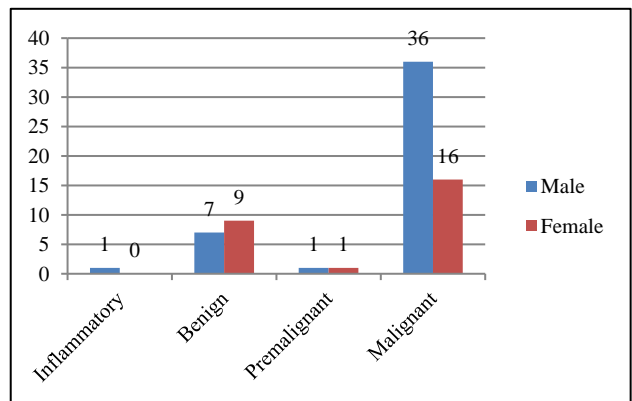
Figure 6: Histological distribution of lesions according to sex.

Sex distribution

Out of 40 cases of oral lesions, 24 were male (inflammatory- 0, benign- 3, premalignant- 1, malignant- 20) and 16 were female (inflammatory- 0, benign- 2, premalignant- 1, malignant- 13). Out of 15 cases of nasal lesions, 6 were male (inflammatory- 1, benign- 4, premalignant- 0, malignant- 1) and 9 were female (inflammatory- 0, benign- 7, premalignant- 0, malignant- 2). Out of 16 cases of laryngeal lesions, all were malignant including 15 male and 1 female.
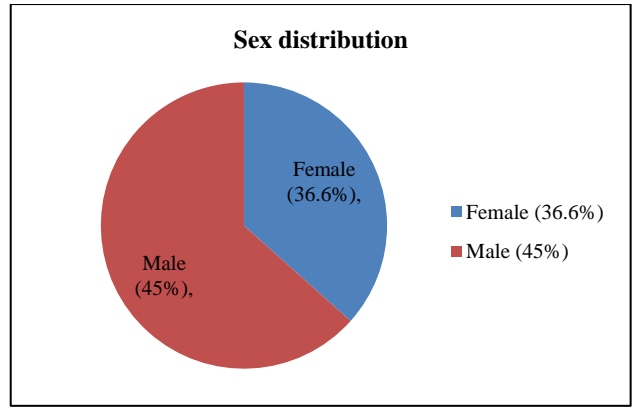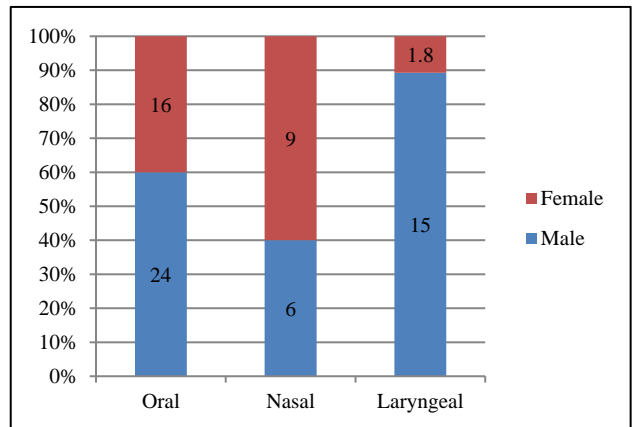
Locality

There were 54 cases in rural area including females- 19 (35.18%), males- 35 (64.81%), inflammatory- 1 (1.8%), benign- 13 (24.07%), premalignant- 1 (1.8%), malignant- 39 (72.22%) and 17 cases in urban area with females- 7 (41.17%), males- 10 (58.82%), inflammatory- 0, benign- 3 (17.64%), premalignant- 1 (5.88%), malignant- 14 (82.35%).

Table 2: Rural urban frequency.

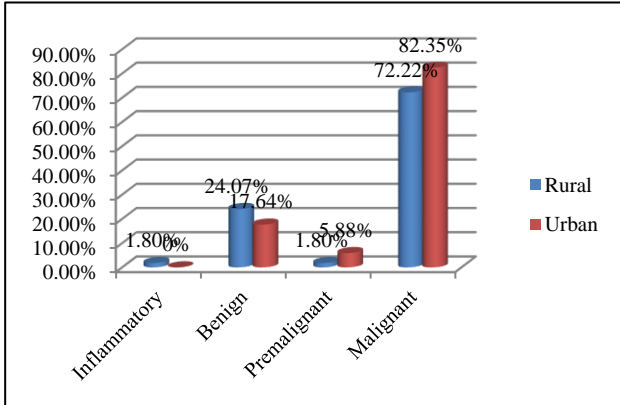|	Frequency	Percent
Rural	54	76.1
Urban	17	23.9
Total	71	100.0

Figure 7: Distribution of lesions according to locality.

Occupation

Occupation wise frequency is given in Table 3.

Table 3: Frequency of lesions according to occupation.

	Frequency	Percent
Unemployed	6	8.5
Labour	34	47.9
Housewife	15	21.1
Farmer	11	15.5
Others	5	7.0
Total	71	100.0

Target biopsy

On narrow band imaging endoscopy 53 lesions were identified as malignant out of 71.
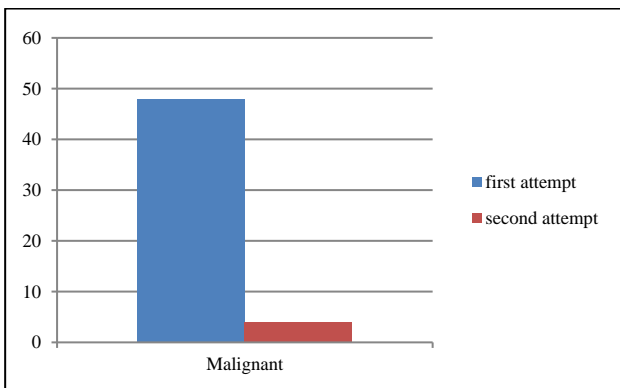

Figure 8: Target biopsy.

With the help of NBI we could able to identify best site of biopsy in 52 lesions on the basis of neo-angiogenesis and superficial capillary proliferation. In one lesion due to high necrosis we could not able to see neo-angiogenesis, so we could not able to identify best site of biopsy. Accurate results in first attempt of biopsy were 48 (92.30%); we have to take second biopsy in 4 cases, because histopathological results were inconclusive.

DISCUSSION

A total of 71 patients were included in study. We analysed all 71 patients under different demographic points. These patients also went under NBI endoscopy. Best site of biopsy were identified on the basis of neo-angiogenesis and capillary vascularity. After which biopsies were taken and histopathology report was done.

Site of lesion

Out of 71 lesions, maximum lesions were found in oral cavity and oropharynx. Maximum malignant lesions were also found in oral cavity. In respect to malignancy lesions were found in order of, oral cavity (63.46%) >larynx (30.76%) >nose + nasopharynx. Stoyanov et al studied the demographics of head and neck cancer patients and the number of cases they found are larynx (30.37%), lips and oral cavity (29.08%).[9] Takiar et al studied the changes in the cancer pattern of men and women in India. In men they found one of the emerging new cancers in India is in mouth.[5]

Age of distribution

In present study maximum lesions were found in age group of 31-40 years and 41-50 years, about 13 cases each. On evaluating 71 patients that were included in our study mean age of presentation of head and neck mucosal lesion was 48 and median was 50. Mean age of presentation of malignant lesions was found to be 54 and median was also 54. Mean age of presentation of benign and inflammatory lesion was 36 and median was 50. From the following data we can conclude up to an extent that with progression of age, malignant lesions increase there can be multiple factors such as prolonged exposure of irritants such as tobacco, smoking, alcohol consumption, environmental factors resulting in increase of malignancy in later stages of life. Stoyanov et al also studied the demographics of head and neck cancer and found the mean age of diagnosis was 63.84±12.65 years, median 65 years.[9]

Sex distribution

In our study male to female ratio was 1.7:1 suggesting predilection of mucosal lesions in male. Oral and laryngeal lesions were more common in males while nasal lesions seen more commonly in females. In females mean age of presentation of mucosal lesion was 44 years, although mean age of presentation of malignancy was 53 years. In males mean age of presentation of mucosal lesion was 50 years and mean age of presentation of

malignancy was 53.76. Male female ratio in case of malignancy was 2.25:1 suggesting malignancy is more common in males. Stoyanov et al found male to female ratio of the registered HNC cases was 3.24:1 in his study.[9]

Rural: urban ratio

Rural urban ratio was about 3.17:1, indicating predilection towards rural society and most of individuals belong to low socioeconomic status. But since our institute is a government establishment, which can be a cause of this result.

Target biopsy

All 71 patients went under NBI endoscopy. We use the criteria to choose best site of biopsy on the basis of neo-angiogenesis and increase capillary vascularity. NBI identified 53 lesions as malignant, out them we could able to identify best site in 52 cases. In 1 case in which we could not able to identify best site of biopsy is due to high necrosis. Among 52 cases we get accurate results in 48 cases, giving us about 92.3% chance of accurate result in first attempt, in rest 4 cases we have to take another biopsy, because histopathological results were inconclusive. Yang et al also studied the use of NBI and found NBI target pathology yielded an accurate laryngeal lesion pathologic specimen acquisition rate of 95.6% (65/68), significantly higher than that yielded by regular biopsy (75.7%, 53/70).[11] We have not done regular white light endoscopic biopsy due to ethical issues, but on comparison of our result to above mentioned study we can say that our result is in accordance with them. We can conclude that NBI directed biopsy yields more accurate lesion pathologic acquisition rate.

CONCLUSION

In our present study we found among head and neck mucosal lesions, maximum lesions were found in oral cavity (about 40 cases out of 71, 56.33%). Malignancy is also more common in oral cavity (about 33 cases out of 52, 63.46%). Total 52 lesions were found to be malignant, among them 44 (84.65%) belong to be of squamous cell carcinoma on histopathology. On evaluating 71 patients that are included in our study mean age of presentation of head and neck mucosal lesion is 48 years. Mean age of presentation of malignant lesions is found to be 54 years. We conclude that up to an extent with progression of age malignant lesions increase. Male to female ratio of mucosal lesions is 1.7:1. Malignancy is more common in males in comparison to females (2.25:1). Narrow band imaging endoscopy helps us to identify best site of biopsy on the basis of neo-angiogenesis and capillary vascularity resulting in more

accurate results, helping in early diagnosis of disease and ultimately reducing morbidity and mortality of patient.

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