Panacea Journal of Medical Sciences 2024;14(1):117–122

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Panacea Journal of Medical Sciences

Journal homepage: http://www.pjms.in/

Original Research Article

Correlation of serum biomarker (LDH, CRP, IL-8) levels in pre-malignant and malignant lesions of head and neck

Harsha Singh[1], S M Faiz[1]*, Mariyam Parveen[1], Kriti Bhatt[1], Abhijeet Singh[1], Samiullah[1]

[1]*Dept. of ENT, Era's Lucknow Medical College and Hospital, Lucknow, Uttar Pradesh, India*

ARTICLE INFO

Article history:
Received 07-10-2022
Accepted 10-02-2023
Available online 13-03-2024

Keywords:
Lactate Dehydrogenase (LDH)
C reactive protein (CRP)
Interleukin 8 (IL8)
Premalignant lesions
Malignant lesions

ABSTRACT

Introduction: A precancerous lesion is often defined as morphologically altered tissue during which the occurrence of carcinoma is more likely than its normal counterpart. Head and neck cancers include cancers of the mouth and therefore the larynx, also as some rarer cancers like cancer of the sinuses, salivary glands, nose, and tympanic cavity. Head and neck cancers are often described as consistent with the sort of cell they begin with. A biomarker could be defined and interpreted as biological molecule which is mostly found in body fluids, blood or even tissues that indicates abnormalities of our body. Here we've taken three biomarkers (LDH, CRP, IL-8) to gauge their level rise in pre-malignant and malignant lesions which are present in our head and neck.

Materials and Methods: Patients attending ENT OPD with primary symptoms indicating premalignant and malignant lesions in the region of head and neck had been included for the analytical study. Complete ENT examination followed by biopsy of the suspicious lesion and blood sample collection was done.

Results: A complete of 30 patients were included in each group of premalignant and malignant lesions. No mean serum rise of serum LDH was noted in premalignant and malignant lesions. A mean serum rise of serum CRP was noted in premalignant lesions but was not noted in malignant lesions. However, both premalignant and malignant lesions noted a mean serum rise of IL-8.

Conclusion: From a future perspective serum evaluation of biomarkers can become a replacement diagnostic modality for the early evaluation of premalignant lesions and malignant lesions and for monitoring the prognosis of an equivalent.

1. Introduction

Some precancerous lesions maybe delimited as a morphologically changed tissue having more chances of malignancy than allure common match, for example, leukoplakia, erythroplakia, etc. A precancerous condition is a state that is having a considerably raised risk of malignancy, for example, submucous fibrosis, oral lichen planus, etc. However, in a World Health Organization (WHO) Workshop, in 2005, it was certain to use the term "pre-malignant disorders (PMD)" as it transmits that not all disorders defined under this term may convert into malignancy.[1] Oral malignancy is the sixth most prevalent tumor. According to the International Agency for Research on Cancer, 2000 there have been 266,000 intraoral cancers and the majority of ruling class happen in the male society (64%). The supposed numbers of cases from oral tumor in the same period were almost 128,000.[2] In the Indian subcontinents, the predominance of this cancer is the second major type with all cancers in males, and is supposed that 100,000 more new cases have being discovered and 90% of all malignancies are squamous cell carcinomas.[3] In addition

* *Corresponding author*.
E-mail address: faz_georgian@rediffmail.com (S. M. Faiz).

https://doi.org/10.18231/j.pjms.2024.022

to raised occurrence, over 50% of patients are dying of it yearly. The plain experience is that over 60% of all subjects present have metastatic spread. It is supposed that about 43% of cancer are on account of cigarette use, intoxicating devouring, wrong diets, sedentary lifestyle and infections. Of these, cigarette is the globe's most preventable cause of tumor. 4 Cancer or neoplasia is a group of afflictions whose essential characteristic is an uncontrolled and chaotic increase of cells. According to a data of National Cancer Institute (NCI), a biomarker is outlined as "a organic part of blood, different bulk fluids, or tissues that display an uncommon or rational process, or a condition or ailment. A biomarker can further be used to analyze in what way or manner well the crowd responds to a situation for a ailment or condition." The present study was done to find the partnership between levels of serum biomarkers (LDH, CRP, IL-8) in premalignant and malignant head and neck lesions.[4–10]

2. Materials and Methods

The study was conducted at the Department of Otorhinolaryngology, ELMCH, Lucknow. Era's Lucknow Medical College & Hospital is a tertiary care center helping generally the socio-economically patients of Lucknow and nearby neighborhoods. The present study done a comparative observational study. Patients having oral lesions in OPD of the Department of Otorhinolaryngology, ELMCH Lucknow were included in the study. Informed consent were obtained from the patient for the study. Approval from the Institutional Ethics Committee was further acquired. The examining frame of the study was as per the completion of the sample size on patient enrollment. Patients between 30-70 years and examination-demonstrated cases were included in the study. A control group was not used in the study for fear that subject will not consent for surgical biopsy due to ethical issues. All doubtful cases accompanying premalignant and malignant lesions of the Head and Neck were examined. From each patient 6ml of blood sample was collected in plain containers. Of that 3ml of sample was transported for serum IL estimation. LDH, and CRP by improved chemiluminescence form in HLS. The additional 3ml of blood was transported to the biochemistry department lab and serum was divided by way of centrifugation and stored at -70 degrees Celsius and was further judged for serum IL-8 via ELISA. A biopsy of the lesion was taken under local anesthesia and was sent for the histopathological test to the pathology department.

3. Results

The present study was conducted to study the correlation of serum biomarker (LDH, CRP, IL-8) levels in premalignant and malignant lesions of the Head and Neck. For this purpose, a group I included 30 patients with precancerous lesions of the head and neck, and group II included 30 patients with cancerous lesions of the head and neck. Tables 1, 2 and 3 have indicated the demographic and clinical profile of cases enrolled in the study.

Table 1: Demographic profile of cases enrolled in groupI (n=30)

S.No.	Characteristic	No.	%
1.	Age		
	30-40 Years	16	53.3
	41-50 Years	10	33.3
	51-60 Years	02	6.66
	61-70 Years	02	6.66
	Mean+ SD (Range) in Years	42.52+09.51 (30-70)	
2.	Sex		
	Male	20	66.6
	Female	10	33.3

Table 2: Demographic profile of cases enrolled in groupII (n=30)

S.No.	Characteristic	No.	%
1.	Age		
	30-40 Years	17	56.6
	41-50 Years	6	20
	51-60 Years	3	10
	61-70 Years	4	13.3
	Mean+ SD (Range) in Years	45.37+12.25 (13-70)	
2.	Sex		
	Male	27	90
	Female	3	10

Age of patients in group I ranged from 30-70 age. Most of the cases (n=16; 53.3%) were aged between 30-40 age followed by 41-50 years (33.3%), 51-60 age (6.66%), and 61-70 age (6.66%).Figure 1 The mean age of cases was 42.52+09.51 age. The age of patients group II is categorized from 30-70 age. The majority of the cases (n=17; 56.6%) were old between 30-40 years followed by 41-50 age (20%), 61-70 age (13.3%), and 51-60 years (10%). The mean age of subjects was 45.37+12.25 age.Figure 2

The most cases group I was men (66.6%). There were 10 (33.3%) women. Male to female ratio group I was 2:1. The majority of group II were men (90%). There were 3 (10%) women. Male to female percentage group II was 9:1. Out of the 30 patients accompanying premalignant lesions, 20 were of leukoplakia and 10 were of Oral Submucous Fibrosis. Out of the 20 patients seen leukoplakia, 11 found to have dysplasia and 9 were pronounced with moderate dysplasia. Out of 30 cases of malignant lesions, 15 were well differentiated and 15 were a less differentiated.

Out of 30 cases in group I, 26 showed normal LDH Values (120-246 U/L) and 4 showed increased values. Out of 30 cases in group II, 25 cases showed normal LDH Values (120-246 U/L) and 5 cases showed increased values.Table 4

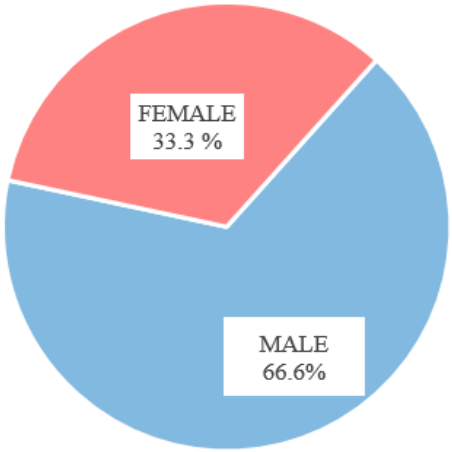

Figure 1: Gender profile of cases in group I

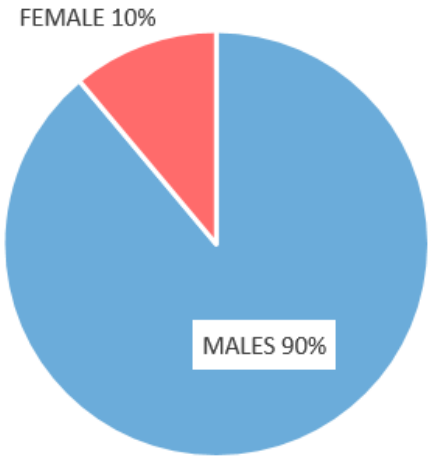

Figure 2: Gender profile of cases in group II

Table 3: Distribution of subjects

Group	Male	Female	Total
Premalignant Lesions			
Leukoplakia			
With mild dysplasia	6	5	11
With moderate dysplasia	8	1	09
Oral Submucous Fibrosis	6	4	10
Oral squamous cell Carcinoma			
Well-differentiated	13	2	15
Moderately differentiated	14	1	15
Total	47	13	60

Table 4: Patient distribution table for Serum LDH in group I and group II.

	Group I(n=30)	Group II (n=30)
120-246 U/L	26	25
>246 U/L	4	5

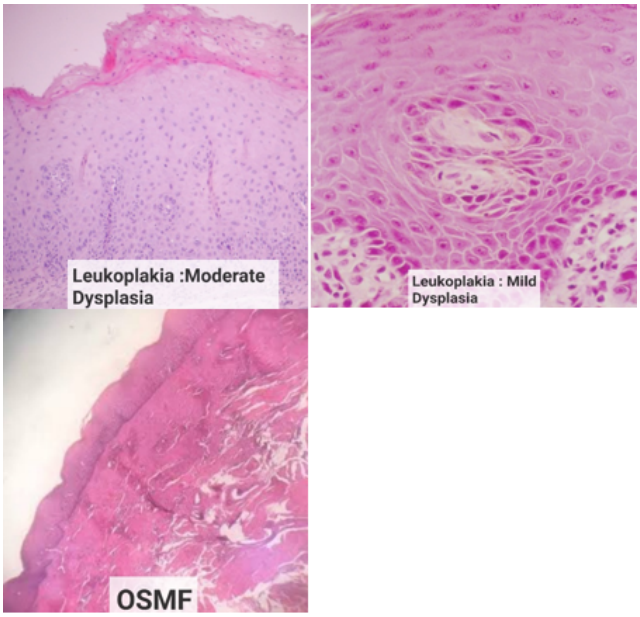

Figure 3: Histopathological slides of premalignant lesions

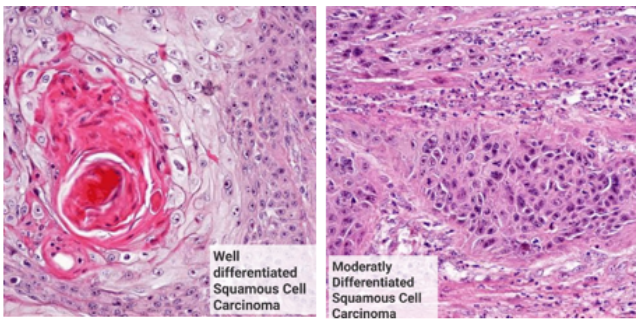

Figure 4: Histopathological slides of malignant lesions

Table 5: Patient distribution table for serum CRP levels in group I and group II.

	Group I(n=30)	Group II (n=30)
<10mg/dL	18	20
>10mg/dl	12	10

Out of 30 cases in group I, 18 cases showed normal CRP Values (< 10 mg/L) and 12 cases showed increased values (>10 mg/L). Out of 30 cases in group II 20 cases showed normal CRP Values ((<10mg/L) and 10 cases showed increased values (>10mg/L).Table 5

Table 6: Patient distribution table for serum IL-8 levels in group I and group II.

IL-8 Levels	Group I (n=30)	Group II (n=30)
<44 pg/ml	0	0
> 44 pg/ml	30	30

Out of 30 cases in group I and 30 cases in group II all cases showed serum IL-8 values greater than the normal standard mean value of 44pg/ml.Table 6

Table 7: Patient distribution table comparing mean serum LDH, CRP, and IL-8 levels between group I and group II

S.No.		Pre-malignant group I	Malignant group II	Statistical significance (Independent Samples 't' test
1	LDH	192.03+50.08	204.74+50.99	p=0.92;t=1.70
2	CRP	13.17+17.08	9.44+12.37	P=0.10;t=1.71
3	IL-8	218.07+85.95	227.18+132.70	P=0.02:t=1.68

The mean serum LDH levels in group I and group II were 192.03+50.08 U/L and 204.74+50.99 U/L individually which was not statistically important. The mean serum CRP levels in group I and group II were 13.17+17.08 mg/l and 9.44+12.37 mg/l individually which was not statistically meaningful .The mean antitoxin IL-8 levels group I and group II was 218.07+85.95 pg/ml and 227.18+132.70 pg/ml individually that was not statistically meaningful. No important distinctness in mean serum LDH and mean serum CRP was noticed group I and group II. However, mean serum IL-8 levels were considerably more than group I (218.07+85.95) as compared to group II 227.18+132.70 (p=0.02).Table 7

4. Discussion

In the present study, we have attempted to study the level rise of the serum biomarker (LDH, CRP, IL-8) in premalignant and malignant lesions of the Head and Neck. [11–14]

For this purpose, a comparative observational study was carried out in which group I included 30 premalignant cases and group II included malignant cases. Age of cases ranged from 30-70 years with a mean age of 42.52+09.51 years for subjects with premalignant lesions and 45.37+12.25 years for subjects with malignant lesions.

The reason for the high dominance of males could be attributed to the high prevalence of adverse oral habits like tobacco and betel nut chewing among males in this part of India. Moreover, the dominance of those in the 30-40 years of age group in both group I and group II could be attributed to the fact that this age group is the most aggressive abusers of these products and it is the age where oral mucosal changes start to take form with the consistent use of these products.

In the present study, mean serum LDH, CRP, and IL-8 levels in patients having premalignant lesions were 192.03+50.08 U/L, 13.17+17.08 mg/l, 218.07+85.95pg/ml(U/L) respectively. Mean serum LDH, CRP, IL-8 in patients have malignant lesions were 204.74+50.99 U/L, 9.44+12.37 mg/L, 227.18+132.70 pg/ml respectively. Increased levels of serum LDH and CRP were present in 4(14%), and 10(35%) patients respectively in group I. Increased levels of serum LDH, and CRP were present in 5(18%), 7(25%) patients respectively in group II. The mean serum IL-8 levels were found to be raised in both group I and group II which were 218.07+85.95 pg/ml and 227.18+132.70 pg/ml respectively (normal mean IL8 = 44pg/ml).

Table 8: The distribution sites for pre-malignant lesions

Site	N=30
Buccal mucosa	27
Hard palate	3
Floor of mouth	0
Lower lip	0
Vestibule of mouth	0
Tongue	0

Table 9: The distribution sites for malignant lesions

SITE	N=30
Buccal mucosa	16
Hard palate	4
Floor of mouth	0
Lower lip	1
Vestibule of mouth	1
Tongue	8

Mean serum LDH in patients with premalignant lesions was 192.03+50.08 U/L which was not per previous studies which reported an increase in serum LDH from the normal range (normal value=120-246 U/L). In a study conducted by Sharma G et al,[8] he reported a mean serum LDH to be 485.66mg/dl in patients having premalignant lesions.

Mean serum LDH in patients with malignant lesions was 204.74+50.99 U/L which was not by previous studies which reported an increase in serum LDH above the normal range. A study conducted by Rathore A et al[9]reported a mean serum LDH to be 323.83 ± 46.80 mg/dl in patients having oral squamous cell carcinoma.

In the present study mean serum CRP in patients with premalignant lesions was 13.17+17.08 (normal value <10mg/l). In a similar study conducted by Metgud et al.[10] and Vankadara S et alwho reported mean serum CRP levels to be 5.91+0.93 mg/l and 5.59±9.86 mg/l respectively in patients suffering from premalignant lesions.

In the present study mean serum CRP in patients with malignant lesions was 9.44+12.37(normal value <10mg/d). Similar studies conducted by Metgud et al.[10] reported an increase in mean serum CRP levels (12.06+1.9 mg/l) in patients suffering from OSCC. [15–18]

5. Conclusion

The findings of the present study concluded that the mean serum level of LDH was increased in cases with malignant lesions as compared with premalignant lesions however the levels fell in the normal range. The mean serum CRP levels (13.17) showed a slight increase in premalignant lesions while they fell in the normal range in malignant lesions. The mean serum IL-8 levels showed an increase in premalignant and malignant lesions from the normal mean value.

In the present study, there are certain limitations in absence of a control group, owing to which it is difficult to state that serum biomarker values are suggestive of any abnormality. Apart from these confounding factors such as the use of tobacco and smoking, anthropometric factors and time since the onset of complaints were not taken into account. Better control over these factors could have given a better opportunity to understand the trend of changes in serum biomarker levels of premalignant and malignant lesions. The present study also highlighted the need for a purposive sampling design, an adequate number of cases for each type of premalignant and malignant lesions, and histopathological, clinical demographic, anthropometric, and dietary details to establish the relationship in a better way.

Given the limitations of the present study, further studies on a larger sample size are recommended with a more systematic purposive sampling design taking into account other clinical and histopathological factors.

6. Acknowledgement

It's our profound indebtedness to our Respected Ma'am Dr. Anuja Bhargava Prof & HOD, Department of ENT, Era's Lucknow Medical College & Hospital for rendering the indulgent guidance and constant support to accomplish this work.We would also like to thank Dr. Noorin Zaidi Associate Professor, Department of Pathology and Dr. Tabrez Zafar Associate Professor, Department of Biotechnology for their advice, support and cooperation which had helped in great extent.

7. Conflict of Interest

None.

8. Source of Funding

This study was supported by Era's Lucknow Medical College, Lucknow, Uttar Pradesh.

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Author biography

Harsha Singh, Senior Resident

S M Faiz, Associate Professor

Mariyam Parveen, Junior Resident

Kriti Bhatt, Junior Resident

Abhijeet Singh, Junior Resident

Samiullah, Professor

Cite this article: Singh H, Faiz SM, Parveen M, Bhatt K, Singh A, Samiullah. Correlation of serum biomarker (LDH, CRP, IL-8) levels in pre-malignant and malignant lesions of head and neck. *Panacea J Med Sci* 2024;14(1):117-122.