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**Research Article**

# LEVEL OF SERUM CREATINE PHOSPHOKINASE IN LEUKOPLAKIA- A BIOCHEMICAL STUDY

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**ABSTRACT**

**Context:** Oral squamous cell carcinomas develop from a premalignant lesion or condition which are due to a variety of aetiological factors.
Early identification of these are necessary in order to prevent them from developing into carcinomas which can reduce the mortality and morbidity and improve the quality of life of a person .There are variety of possible aids like histopathology, cytology, histochemistry and Enzyme assays in diagnosing these. However histopathology has many limitations which can be overlooked by an enzyme essay technique.
Keeping this in mind a study was planned to evaluate the association between the serum CPK and oral Leukoplakia.
**Aims:** Aims and Objectives of the study-

1. To assess the level of CPK in leukoplakic patients and normal subjects.
2. To compare the result

Study design Out patients visiting the department of Oral Medicine and Radiology, Coorg Institute of Dental Sciences, Virajpet in the age range of 30-50 years old males. With smoking habit for more than 5 yrs. 20 subjects were selected and the lesion was subjected to histopathological examination and blood samples were collected and sent for biochemical analysis.

Statistical analysis used: student t test

**Result**
Mean CPK value of the control group was 96.6 and that of cases was 102.25. Statistical analysis was done using student t test and it was not statistically significant (p=0.441). Correlation between age and CPK value was done and the correlation(r) is -0.083 but it was not significant statistically (p=0.611).

**Conclusions**

From this study it can be concluded that a definite correlation between CPK enzyme and oral leukoplakia lesions cannot be obtained as it is dependent on different factors like the severity of lesion, grades of dysplasia and invasiveness of lesion.



## INTRODUCTION

Moderisation fast moving life style and fast food habits all put together has increased the prevalence of head and neck cancer. The total burden of cancer is estimated to be 22 million out of which 10 million cases are diagnosed every year. Cancer pattern varies between the different races in a country. As a general rule the common cancer seen in males is lung and in females breast. However head and neck cancer also follows some sex predilection. Males are attacked more than females with respect to oral cavity in particular[1]. Out of the most oral cancer the majority are oral squamous carcinoma arising from lining buccal mucosa. The overall percentage being 5.5%. of all malignancies. The concept of precancer arised since 1972 when the WHO workshop classified depending upon the clinical criteria to identify a lesion[2]. But this concept of precancer was redefined in a workshop held in UK 2005 to potentially malignant disorders since all these lesions do not transform in to malignancies, rather that there is a cluster of morphological alterations due to which some may have an increased potential for malignant transformation. However these are indicators of future malignant lesions there by an another concept of Field cancerization given by Slaughter was explained[3]. All these

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lesions show some amount of cellular alteration or cellular atypia which are consistent to oral carcinomas. But these changes may not be evident in a clinical setup during the routine oral examination with basic instruments. Hence an early detection of these lesions are necessary to find out the premalignant changes going on within them[4]. The early detection of these lesions is well documented.[5]

The various methods of early detection and their significance is also well documented.[6-11] the easily available body fluids are saliva and serum. To examine these do not need a complicated invasive procedure as is required in routine biopsy. The importance of biological biomarkers and their significance in relation with dyspalsia is also documented.[12] hence taking a muscle enzyme CPK as a biological marker a study was planned. CPK had shown its significance in different studies done by different authors.[5]

***Subjects and Methods***

Out patients visiting the department of Oral Medicine and Radiology, Coorg Institute of Dental Sciences, Virajpet in the age range of 30-50 years old males.

Methods and Material: Out patients visiting the department of Oral Medicine and Radiology, Coorg Institute of Dental Sciences Virajpet in the age range of 30-50 years old males. With smoking habit for more than 5 yrs. 20 subjects were selected and the lesion was subjected to histopathological examination and blood samples were collected and sent for biochemical analysis. All the demographic details were recorded along with dental status of patient. 20 Patients were selected after through clinical examination. A detailed case history was taken along with description of the lesion on the buccal mucosa. Only classical case of oral leukoplakia was included. The lesion was subjected to toluidine blue staning and there after biopsy and histopathological examination.

Inclusion criteria – All male patients of age 30-50 yrs having a smoking habit for more than 5 years were selected and patient willing for the study and treatment thereafter.

The Exclusion criteria were physically and mentally disabled and Patient with history systemic illness and patients not willing for biopsy.

Result - Mean CPK value of the control group was found to be 96.6 with a standard deviation of 27.82 and a standard error of 6.22. (Table 1, figure 1). Mean CPK of the cases was 102.25 with a standard deviation of 16.73 and a standard error of 3.74. (Table 1, figure 1). When the mean CPK of the cases are compared with the controls using student t test it was not statistically significant (p=0.441) (table 1, figure 1). Correlation between age and CPK value the correlation(r) was -0.083 which means a probable negative correlation and the P value was 0.611 which showed that it was not significant statistically.(figure 2 ,3).

## DISCUSSION

Cancer is one among other diseases which possess a great threat to life. It can leave a person debilitated for the remaining period of life and also it can cause much havocs to the person's quality of life. The annual incidence of oral cancer is much more as per the literature which are due to the deleterious oral habits. The prevalence of potentially malignant disorders from these habits are well documented and the malignant transformation is also well documented.[9] There are different studies done related to these lesions each giving its own significance. A study done by Shyam *et al*, Surendran *et al* and Prasad *et al* showed the significance of smoking to these lesions. They also mentioned the prevalence of Potentiality of theses lesions in their study.[13-15] When there is a potentially malignant transformation then dysplastic features can be identified as described by Dost *et al* in their study[4]As dysplastic changes denote the potentiality of the lesion for malignant transformation there are different methods for evaluating it other than the usual biopsy.[9,10]

Our study also outlines an alternative method to the usual biopsy where in biopsy cannot be done due to any systemic reasons. Our study makes use of muscle enzyme in the context that these lesions cause dysplastic in their later stage which can involve the muscle layer.

**Table 1** Mean and standard deviation

| Group | Number | Mean | Standard deviation |
|---|---|---|---|
| Control | 20 | 96.6 | 27.827 |
| Case | 20 | 102.3 | 16.739 |

Students t test, P value =0.441 ,Not significant

**Table 2** Correlation between Age and CPK value

| Variable | Mean | Standard deviation |
|---|---|---|
| Age | 39.8 | 5.331 |
| CPK value | 99.43 | 22.846 |

Correlation = -0.083, p=0.611 not significant

Spoorthy *et al* has done a study on leukoplakia patients taking enzyme CPK.[16] Our study was also centered to find out the influence of CPK on leukoplakia patients .Similar to this other studies were also carried out using micronutrients to find out their influence .[10] They have found out a positive correlation. Spoorthy *et al* showed the influence of CPK on leukoplakia lesion. The probable alteration in CPK value of serum is centred on damage to the muscle layer in the involved buccal mucosa. Similar studies were done on hamsters by other authors to find out the influence of CPK on muscle damage in different cancer like prostate, lung, GIT and have got varying result which showed an influence of this enzyme which is present in muscle.[16] The influence of the CPK in muscle damage can be related to the fact that CPK is a constituent in muscle fibre which is released during a muscle damage which is stated in our own previous study on Oral Submucous Fibrosis. However the exact release of this enzyme is not clearly understood. But the muscle damage can be attributed to the overuse trauma due to local irritation which causes damage to fibrils which in turn is responsible for release of the enzyme.[17] However our study could not find a significance correlation between the CPK and leukoplakia. The correlation between the age also could not show much significance. The highest variation showed was in only one patient that too it was with in normal limit. The probable reason for this can be due to the damage done to muscle in a leukoplakia could be minimal when compared to other lesions like OSMf.[16,17]. This can be attributed to the different pathophysiology of Oral Leukoplakia when compared to OSMF where in more muscle fibres are involved .Our study showed the correlation was only 0.083

between age and CPK value which is negative. This shows that eventhough as the age increases there is no significant change in enzyme release in muscle when underlying mucosa and muscle fibres are involved in dysplastic changes. However in our previous study with OSMF there is considerable slow muscle damage because the pathophysiology of OSMF has relation with muscle metabolism.[17] The insignificance of the value in our study can be attributed to the pathophysiology of oral leukoplakia wherein even though there is dysplastic change in the buccal mucosal epithelium the involvement of muscle is still under question mark and the lesion is still not invasive .In our study all the participants had leukoplakia which showed dysplastic changes but dysplastic feature alone cannot be hold for invasiveness.[18] Other factor can be that the small sample group, which can be attributed to the P value of the study. However with similar less study subjects the significance of CPK is shown in study done by Spoorthy *et al* [16]. This can be substantiated for the different cytokines released during the chronic irritation to the oral epithelium which in turn reflects its value in the serum irrespective of the severity of muscle damage produced.

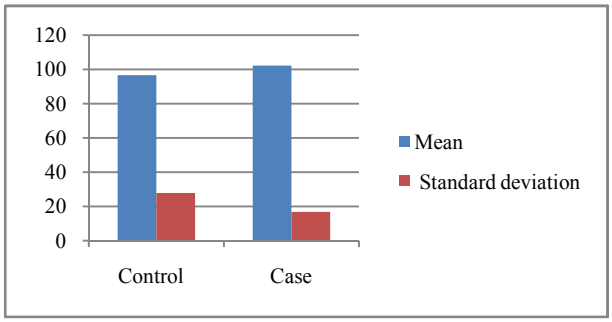


**Figure 1** Mean CPK value in Case and Control

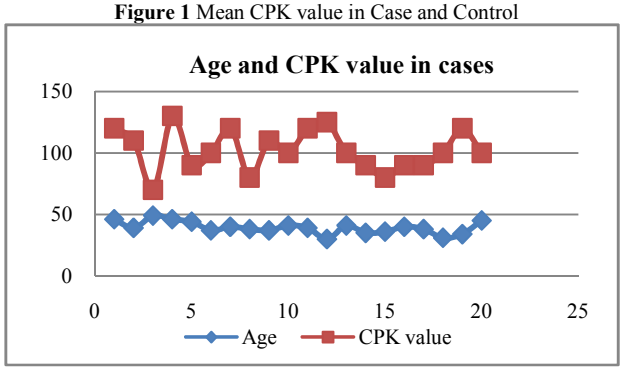


**Figure 2** Age and CPK value in case.

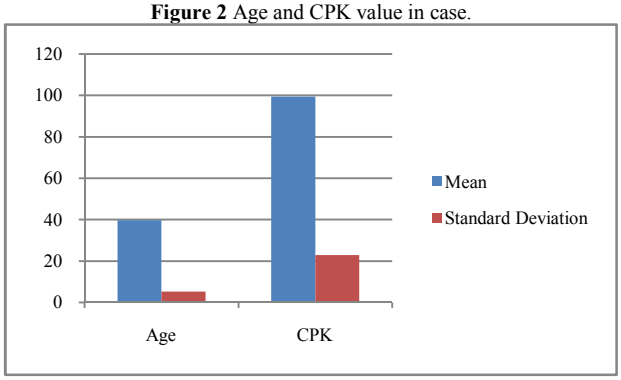


**Figure 3** Mean of age and CPK in cases.

However when CPK is concerned the amount of muscle damage produced alone is responsible for the serum value change. The value is not constant and reduced as the muscle recovers. This type of damage is more seen in cardiac muscle, wherein after a myocardial infarction the values shoot up.[17] Whatsoever when taking CPK as enzyme solely in cases of oral leukoplakia irrespective of grade of dysplasia the P value is not significant. This could be probably due the low grade of dyspalsia or due to the less invasiveness of the lesion. So much severe grades of dyspalsia or a carcinoma in situ might show an alteration in serum CPK value. With these factors it can be said that the study of oral leukoplakia lesions with respect t to CPK enzyme cannot be regarded as authenticated one until and unless a large volume of subjects with higher grade of dyspalsia is studied.

## CONCLUSION

From this study it can be concluded that a definite correlation between CPK enzyme and oral leukoplakia lesions cannot be obtained as theit is dependent on different factors like the severity of lesion, grades of dysplasia and invasiveness of lesion etc. Furthermore a study with more samples might give some significance of CPK with oral leukoplakia lesions. However considering the few limitation in our study were the lesions size, grading of dyspalsia, duration, gender relation, individual physical activity which can be overcomed in a large multicentre trials.

## References

1. Anupam Mishra, Rohit Meherotra. Head and Neck Cancer: Global Burden and Regional Trends in India. *Asian Pacific Journal of Cancer Prevention, Vol 15, 2014*
2. Naoki Watanabe, Tsunemasa Ohkubo, Masahito Shimizu, and Takuji Tanaka. Preneoplasia and carcinogenesis of the oral cavity. Watanabe et al. Oncology Discovery 2015
3. S. Warnakulasuriya , Newell. W. Johnson, van der Waal. Nomenclature and classification of potentially malignan disorders of the oral mucosa. j Oral Pathol Med (2007) 36: 575–80
4. F. Dost, BOralH, MPhil. Malignant transformation of oral epithelial dysplasia: a real-world evaluation of histopathologic grading. OOOO: 117 (3)
5. Biju baby joseph, shiny George. Level of serum creatine phosphokinase in oral submucous fibrosis - a biochemical study. Int J Cur Res Rev. july 2015; 7(13).
6. Jesper Reibel. Prognosis of oral pre-malignant lesions: significance of clinical, histopathological, and molecular biological characteristics. Crit Rev Oral Biol Med. 2003 14(1): 47-62
7. Esam Omar. Current concepts and future of noninvasive procedures for diagnosing oral squamous cell carcinoma - a systematic review. Omar Head & Face Medicine. 2015 11:6.
8. Vucicevic Boras Vanja. The Significance of Salivary Cytokines in Oral Leukoplakia. J Autacoids Horm. 5 (1)
9. Apekesha RB. Estimation and Comparitiv evaluation of serum iron, copper zinc, and copper/zinc ration in oral eukoplakia, oral submucous fibrosis, and squamopus carcinopma. JIAOMR april –june 2010;22(2):73-26

10. Amith Kumar, Suchetha kumari. Estimation of Serum Micronutrient Levels and The Possible Risk Of Oral Cancer And Premalignancy Amith Kumar, Suchetha kumara. IJIRSCT. January 2014; 3 (1).
11. Farzaneh Agha-Hosseini . Serum and saliva collagenase-3 (MMP-13) in patients with ora lichen planus and oral squamous cell carcinoma. MJIRI. June 2015; 29.(218).
12. Sunali Khanna. Aserum biomarkers in oral precancer and squamous cell carcinoma. 13th int. symposium on metal ions in biollgy and Medicine.
13. Shyam sundar behura. Oral Mucosal Lesions Associated with Smokers and Chewers – A dCase-Control Study in Chennai Population. *Journal of Clinical and Diagnostic Research*. July 2015 ; 9(7): ZC17-ZC22
14. Surendra Kumar. Tobacco Use and Oral Leukoplakia: Cross-sectional Study among the Gond Tribe in Madhya Pradesh. *Asian Pacific Journal of Cancer Prevention, 2015; 16.*
15. K N Prasad. Prevalence of Erythroplakia and Leukoplakia among the tobacco users aged above 60 years in rural area of Pondicherry. Sch. Acad. J. Biosci., 2015; 3(1A):30-33.
16. Spoorthy B R. serum creatinine phosphokinase: a potential diagnostic tool for oral primaligant lesions-?. A histopathological - biochemical study. Indian J Stomatol.2011; 2 (2):86-90.
17. Biju Baby Joseph, Shiny George Level of serum creatine phosphokinase in oral submucous fibrosis – A biochemical study.
18. Brad W. Neville. Oral Cancer and Precancerous Lesions. CA Cancer J Clin 2002;52:195-215

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