



CODEN [USA]: IAJPB

ISSN: 2349-7750

**INDO AMERICAN JOURNAL OF
PHARMACEUTICAL SCIENCES**

<http://doi.org/10.5281/zenodo.3244125>

Available online at: <http://www.iajps.com>

Research Article

COMPARATIVE EVALUATION OF SALIVARY ZIN AND COPPER IN ORAL SUB-MUCOUS FIBROSIS PATIENTS AND NORMAL CONTROLS AT ISRA UNIVERSITY, HYDERABAD

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Article Received: April 2019

Accepted: May 2019

Published: June 2019

Abstract:

OSMF (Oral submucosal fibrosis), a progressive and irreversible condition results in inability to tolerate spicy food and mouth opening following fibrosis of submucosal tissues. Changes in the oral epithelium precede the submucosal fibrogenesis follows oral epithelial alterations further restricting the tongue movements and making the soft palate fibrosis that may result in Eustachian tube dysfunction as well. It is multifactorial in origin including consuming areca products, red chilies, deficiencies (nutrient and vitamins), altered saliva and genetic factor. Areca is the most common cause of OSMF due to its tannins and arecoline contents with strong fibroblast proliferation potential. This work elaborates and compares the role of changes in the saliva contents of copper and Zinc as a potential cause of OSMF. The male were 44(73.33%) and female 16 (26.67%) with p-value 0.55. Salivary mean copper (Cu) was noted $97.9 \pm 17.38 \mu\text{g/dl}$ in controls group (A) while it was $118.7 \pm 7.55 \mu\text{g/dl}$ in known cases of OSMF (B group) with a significant $P=0.000013$. Mean Salivary Zn in control group (A) $63.6 \pm 17.8 \mu\text{g/dl}$ while in group B (Known cases of OSMF) it was $102.5 \pm 14.9 \mu\text{g/dl}$ $p=0.00001$ (highly significant).

Conclusion: *There is significant difference between the serum copper and zinc concentration among the normal controls and OSMF patients suggesting their role in the pathogenesis of the disease.*

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Please cite this article in press Uzma Tariq et al., *Comparative Evaluation of Salivary Zin and Copper in Oral Sub-mucous fibrosis Patients and Normal Controls at Isra University, Hyderabad., Indo Am. J. P. Sci, 2019; 06[06].*

INTRODUCTION:

Oral submucosal fibrosis an irreversible condition that develops over time progressively is of multifactorial origin like usage of areca products and red chilies, certain deficiencies of nutrient and vitamins, changes in composition of saliva along with genetic influences. Fibrosis of palate, epithelial changes may affect the tongue movements as well as Eustachian tube [1]. Areca is the mostly reported as agent used frequently and to cause this condition[2,3]. Areca is believed to possess this property due to tannins and arecoline that induce the fibroblast proliferation as well as collagen synthesis in the submucosal tissues[4]. It is also assumed that Areca nuts contain copper, iron, magnesium and zinc and iron that may be predisposing the users to OSMF [5]. Two possible mechanism for fibrosis are raised copper in saliva activates the dependent fibroblast activating oxidase and mutations of P53 aberrations [5-8]. Zinc is thought an important element for cell cycle regulation of cell cycle and mitosis, though activation of DNA polymerase it causes DNA replication. Increased zinc in serum and saliva of OSMF patients has been reported [9]. Areca nut is so common in social consumption by various communities in different commercially available preparations in pure form as well as mixed with other agents in the endo-Pak region especially like Paan, Gutka, mainpuri etc. Trace element are required in so small minute quantities to play physiological as well as metabolic functions in humans body systems approximately >25% enzymes require them for their activated[10]. Previous workers, Mohammed et al (2014) and Dharmadhikari et al(2016)) recommended the saliva sample collection as the most suitable, noninvasive and convenient procedure for multiple diagnostic purposes [11,12] Researchers previously used Okade et al(2015), Shetty et al(2015)and Arakeri et al(2014) used saliva to estimate the trace elements but found non-conclusive[13-15]. So this study was arranged as well as the research on the

concerned topic was not available in our region so we focused the current work on evaluation and comparison of copper as well as zinc concentration in the saliva of the normal controls and patients of OSMF at Isra University hospital, Hyderabad, Sindh , Pakistan. Hope this work will add in scientific knowledge available on the concerned topic

METHODOLOGY:

Patients of both genders with known diagnosis of OSMF (30 in number) were selected from dental department of Isra University and 30 normal age and sex matched individual were also selected by non-probability sampling. Biodata was obtained on study proforma and samples of saliva were taken from both normal and diseased individuals. Salivary copper and zinc were measured in isra journaly Obtained values were analyzed on SPSS version22 using t-test keeping level of significance at p-value < 0.05

RESULTS:

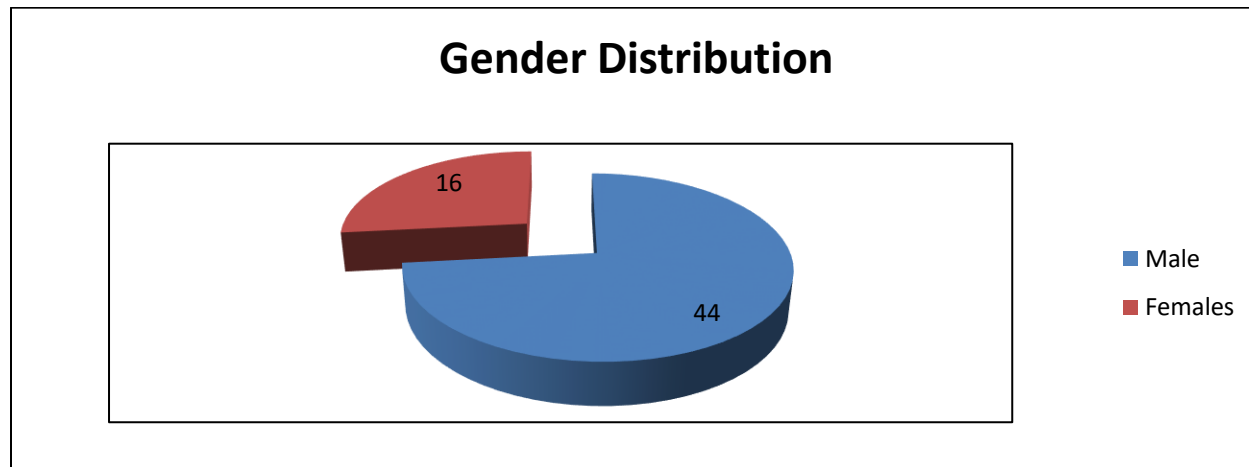
The male were 21 (35%) in group A while 23 (38.33%) in group B with total male study subjects as 44(73.33%) whereas female were 9 (15%) in controls and 7 (11.67%) in cases with 16 (26.67%) as overall female content and a non-significant P-value of 0.55(Table.2). Mean copper (Cu) concentration in Saliva was 97.9 µg/dl with SD 17.38 µg/dl in normal controls (group-A) whereas it was noted 118.7 µg/dl with SD 7.55 µg/dl in group-B (known cases of OSMF) the difference was highly significant statistically(P=0.000013). Mean concentration of Salivary Zn 63.6 µg/dl with a standard deviation of 17.8 µg/dl in control group while it was 102.5 µg/dl with standard deviation of 14.9 µg/dl among Known cases of OSMF (Group-B) and the p-value was 0.00001 which highly significant. Mean ages was observed as 22.80+ 4.61 years in controls and 23.33+4.97 years in cases having non-significant difference p=0.67 (Table.1).

Table01: Showing statistical analysis of the variables on t-test

S. No	Parameters	Group A(n=30)	Group B(n=30)	t-score	P-Value
1.	Age (Years)	22.80± 4.61	23.33±4.97	-0.42	0.67
2.	Salivary Copper(µg/dl)	97.9 ± 17.38	118.7 ± 7.55	-6.01	0.000013
3.	Salivary Zin(µg/dl)	63.6 ± 17.8	102.5 ± 14.9	-9.17	0.00001

Table02: Comparison of male to distribution

S. No	Parameters	Group A	Group B	Total	P-Value
1.	Males	21 (35%)	23 (38.33%)	44(73.33%)	0.55
2.	Females	9 (15%)	7 (11.67%)	16 (26.67%)	
3.	Total	30(50%)	30(50%)	60(100%)	



DISCUSSION:

Consistent finding about the age and gender were described by Okade et al (2015) mean age reported by him was 29.2 ± 8.51 years while 96% of his study patients were male, similarly zinc concentration was reported low by him however non-significant difference in the salivary copper was reported by him between control and cases we find these as significant [13]. Inconsistent finding about age and gender were reported by Chitra Set al (2012) with majority of the study population were females and most of them (79%) belonged to old age possibly due to wide age of inclusion in his research [16]. Another consistent study was by Dey et al 2016 same sample size was used by him (30 controls +30 OSMF=60), salivary Copper was high reported in OSMF patients while low in controls but regarding salivary zinc his findings are inconsistent as he reported no statistically significant difference between normal and diseased subjects [17]. Salivary copper was also reported consistent between the two groups by Ayinampudi et al (2012) [18]. These disturbances in salivary copper seem to occur due to areca chewing as it was earlier described by Trivedy et al (2000) that areca nut contains approximating 302 nmol/g, [19]. Copper is released on chewing areca nut that comes in contact with mucosal epithelium it gets dissolved in saliva and thus the surrounding mucous interfering with the enzymatic activity. The rise in salivary Zinc provides some protection against radicals induced injuries owing to its anti-oxidant properties. The biochemical assessment of serum copper level is important in OSMF patients as it may prove helpful in non-invasive diagnostic measure to guide the proper clinical management.

CONCLUSION:

Significant difference exist between salivary copper and Zinc concentration between normal and OSMF

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