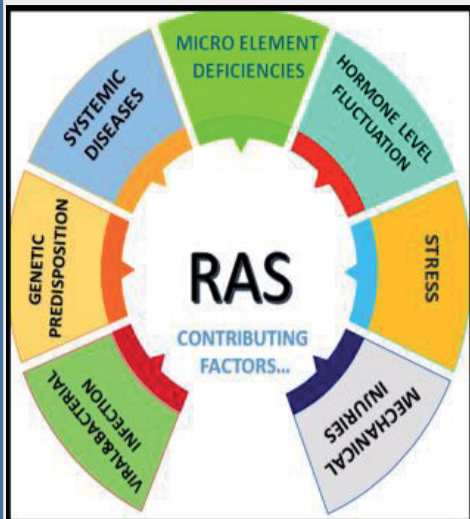


SALIVARY TRACE ELEMENTS AS BIOCHEMICAL MARKERS OF RECURRENT APTHOUS STOMATITIS



INTRODUCTION

Recurrent aphthous stomatitis (RAS) is one of the most common chronic, inflammatory, ulcerative conditions of the oral mucosa and is characterized by the appearance of painful, recurring solitary or multiple ulcerations that usually appear on non-keratinized oral mucosa. The ulcers are well-circumscribed yellow-coloured lesions surrounded by an erythematous halo.

PATHOGENESIS: To date, the etiopathogenesis of this condition remains ambiguous; it is, however, considered to be multifactorial.

PREDISPOSING FACTORS: The various predisposing factors include genetic factors, stress, trauma, endocrinal disturbances, microelement deficiencies, etc. Oxidative stress is also said to play a role in the pathogenesis of RAS. Micronutrients like copper, iron, and zinc contribute to the body's natural defenses on three levels by supporting physical barriers - skin/mucosa, cellular immunity, and antibody production.



Serum iron (Fe) and copper (Cu) levels have been analysed in subjects of RAS. A non-invasive method of trace element detection like saliva in RAS has not been attempted. The present pilot study was conducted to analyse & compare Fe and Cu levels in saliva as well as serum of RAS patients and also to establish salivary trace element levels as biochemical markers in the pathogenesis of RAS.

Materials and Method: A total of 20 subjects including 10 patients with RAS and 10 persons as sex- and age-matched healthy controls formed the pilot study.

Inclusion criteria: The patients included had had at least three recurrences of aphthous in last one year.

Exclusion criteria: Patients having any systemic disease, traumatic ulcers, drug allergies, or having any microelement supplementation were excluded from the study.

Method: After verbal consent and a detailed clinical history, 5 ml blood was withdrawn via venipuncture and 5ml unstimulated saliva was collected in special sterilised bottles for determination of Fe and Cu levels.

•Saliva collection was done between 8am - 11am. Both saliva and blood were centrifuged for 10 minutes at 3,000 rpm.

•Serum as well as saliva supernatant were extracted and stored at -200C until shortly before assay, which was done via **SEMI-AUTOANALYZER (TECHNO)**.

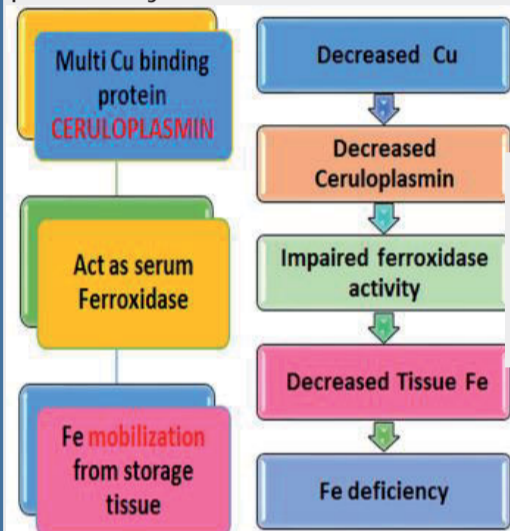


FIG: Fe & Cu Interactions



SAMPLE COLLECTION



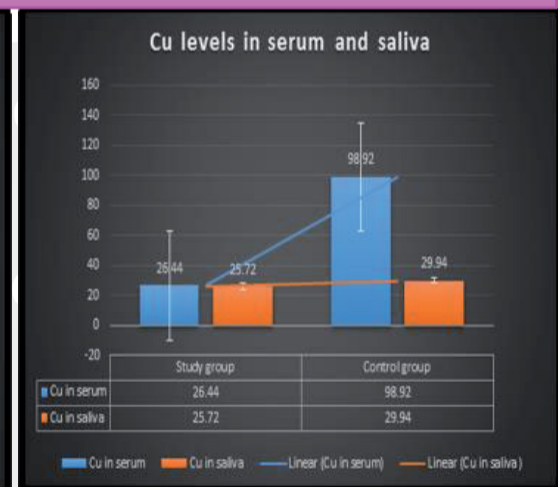
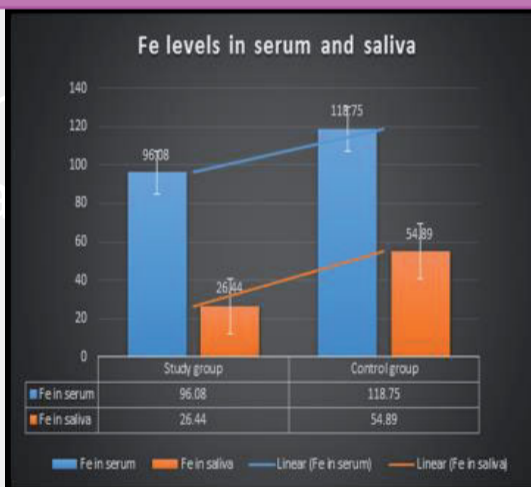
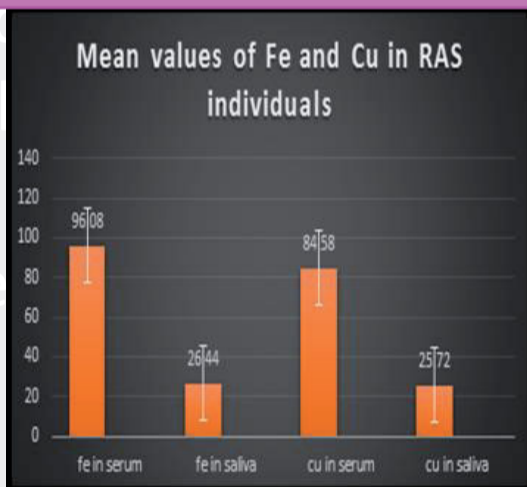
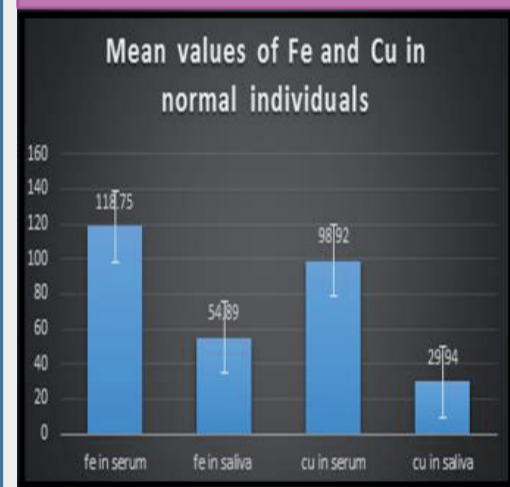
FIG: SUPERNATANT



FIG: SEMIAUTOANALYZER

RESULTS

All parameters were statistically analysed. Significant correlation was found in serum and salivary copper and iron levels in RAS patients. The patients were found to have significantly lower levels of trace elements in serum and saliva than in healthy controls. Micronutrients levels in saliva were found to be lower than in the blood serum of both control & study groups.



DISCUSSION

Recently, saliva has emerged as a noninvasive tool to detect trace elements in various diseases. Numerous studies have investigated role of salivary trace elements as biochemical markers but none on RAS. Shruthi L et al found statistically significant decrease in serum iron levels in RAS patients. Our study, revealed significant results in serum as well as salivary iron and copper levels in RAS and healthy controls. Extensive search of literature shows no evidence of use of salivary trace elements (Fe & Cu) in establishing biochemical markers in pathogenesis of RAS. This study appears to be first attempt in using salivary as well as serum trace elements as BIOCHEMICAL MARKERS of RAS.

CONCLUSION

With collective efforts over several years, saliva has been demonstrated to be a promising bodily fluid for early detection of diseases. Like blood, it contains different substances that reflect physiological status; however, unlike other bodily fluids, salivary diagnostics offer an easy, inexpensive, safe, and noninvasive approach for disease detection, and possess a high potential to revolutionize the next generation of diagnostics. More studies with larger sample sizes on salivary trace elements must be warranted to establish them as biochemical markers in pathogenesis of RAS.

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RECENT STUDIES USING SALIVA AS A DIAGNOSTIC TOOL

Author	Study	Year
Canatan D et al	Thalassemia and iron deficiency anemia	Mediterr J Hematol Infect Dis 2012
Costa EM et al	Caries Activity in Pregnant Women	Rev Bras Gynecol Obstet 2016
Buche BO et al	Children with Dental Caries	Iran J Public Health 2016
Carasu EM et al	Oral Cancer and OPMDs.	REV.CHIM.(Bucharest) 2016

PREVIOUS STUDIES USING SERUM IN RAS

Author	Study	Year
Shruthi L et al	Role of copper and iron deficiencies	Int. Res. J. Pharm. 2013
Khademi H et al	Zinc Level	IJDR 2006
Saxena S	Antioxidant status	RSBO 2011
Ozturk P et al	Cu/Zn and Cu/Se ratios, and oxidative stress	J Trace Elem Med Biol 2013