Journal of Cardiovascular Disease Research
ISSN: 0975-3583, 0976-2833 || VOL 15, ISSUE 12, 2024

Serum Zinc Levels In Chronic Tonsillitis-An Observational Study

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ABSTRACT

Background : Chronic tonsillitis is the chronic inflammation of the palatine tonsils. . It is a chronic inflammatory process where the immune system is altered leading to low antioxidants level.Zinc acts by maintaining tissue function and immunity.

Objectives: The present study was carried out to study relationship between serum zinc levels and chronic tonsillitis.

Materials and methods : It is a case control study carried on 50 cases of clinically diagnosed chronic tonsillitis and 50 healthy controls. Serum zinc levels were measured in both cases and controls.

Results : Serum zinc levels were significantly decreased in cases of chronic tonsillitis as compared to controls

Conclusion : Serum zinc has role in maintaining tissue function and its supplementation in deficient individuals helps in faster recovery.

Key words: Serum Zinc, Chronic tonsillitis, Immunity

Introduction

Chronic tonsillitis is the chronic inflammation of the palatine tonsils which occurs as a result of repeated attacks of acute tonsillitis or due to inadequately resolved acute tonsillitis. It mostly affects children and young adults. It is a common disease characterized by recurrent upper respiratory infections ,dysphagia, throat pain , fever[1]. It is a chronic inflammatory process where the immune system is altered leading to low antioxidants level. During chronic inflammation, oxidation products are produced which leads to tissue injury[2].

Free radicals released during tissue injury leads to damage of membrane lipids , which decreases the immune function of leucocytes. These free radicals are neutralized by antioxidants[3,4]. Imbalance in between the oxidants and antioxidants leads to reduced immunity in chronic inflammation.

Zinc is an essential trace element. It is found in nearly 300 specific enzymes [5].The function of zinc in the body metabolism is based on its enzymatic affinity, way of a zinc enzyme complex or zinc metalloenzyme[6]. It

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plays an important role in the maintenance of several tissue functions. It plays a role in immune function, protein synthesis, wound healing, DNA synthesis, and cell division. It is required for maintaining intestinal cells, bone growth and immune function. Zinc deficient children are at increased risk of restricted growth and developing diarrheal diseases and respiratory tract infections.

Zinc has a role in thymus dependent "T" cell mediated immune response. It combines with thymic hormone to form the biologically active thymic hormone. The reduced circulating zinc levels is associated with reduced T cell production of certain critical proteins called cytokines which regulate immune response [7]. There is a strong relation between serum zinc levels and immunity of the patient . Hence the present study was carried out to study relationship between serum zinc levels and chronic tonsillitis.

Materials and methods

This was a case control study .Fifty cases of chronic tonsillitis attending the ENT out patient department of Koppal Institute of Medical sciences , Koppal were included in the study . Patients in the age group of 5 to 30 years were included in the study. Fifty(50) age and sex matched healthy subjects were taken as controls. Ethical clearance was obtained from the institute's ethical clearance committee. Patients with history of recurrent tonsillitis 5 or more attacks of sore throat or acute tonsillitis per year for more than 2 consecutive years, 3 or more attacks for more than 3 years were included in the study.

Those with history of immunodeficient disorders, h/o chronic disorders, those with h/o micronutrient supplementation in the recent past were excluded from the study.

Biochemical analysis

Venous blood sample was collected from antecubital vein under all aseptic precautions. .It was allowed to clot and serum was separated to analyse serum zinc levels using chem5 V2 semiautoanalyser. Serum Zinc levels were measured using NITRO-PAPS method [8].(kit supplied by Tulip diagnostics).

Data was analyzed by statistical tests by using SPSS package version number 19. Data was expressed in terms of mean ± SD. Chi- square test was applied to estimate the difference between the two groups of population. Unpaired 't'-test was used to study the changes in levels of serum zinc. p value < 0.05 was taken as statistically significant.

Results

This was a comparative case control study conducted on 50 cases of clinically diagnosed chronic tonsillitis (n=50) and 50 healthy controls(n=50). The patients belonged to the age group of 5 to 30 years. The mean age of cases was 15.3 years and that of controls was 15.8 There is no statistically significant difference in age and gender in between cases and controls.($p>0.05$) .

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The mean serum zinc levels (µg/dL) in cases of chronic tonsillitis is shown in **Table 1** .The serum zinc levels were decreased in cases compared to controls.

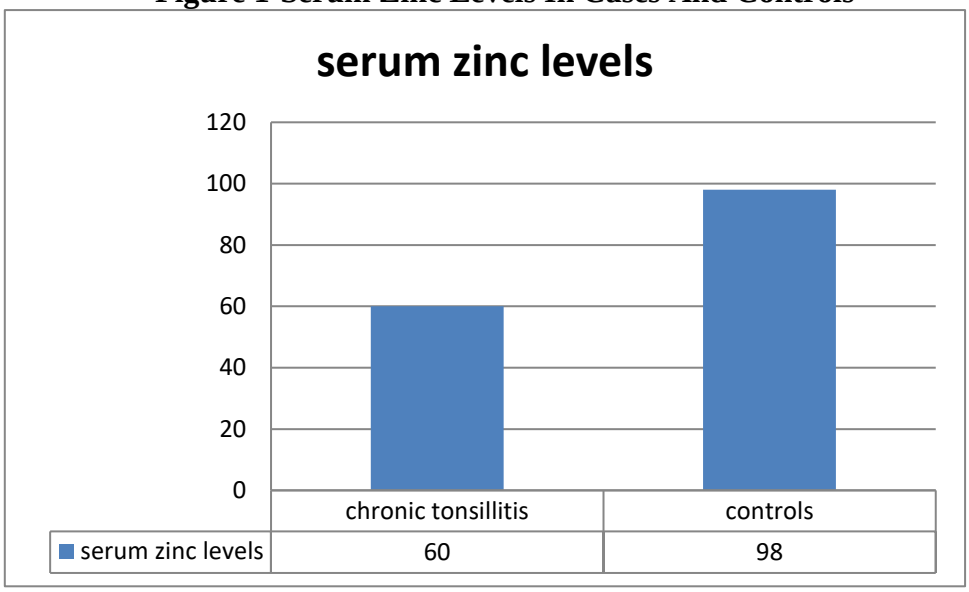
Serum zinc: The mean serum zinc levels (µg/dL) in cases of chronic tonsillitis were 60.4 ± 10.9 , whereas in controls were 98.16 ± 12.4 respectively and it was highly significant. ($p < 0.0001$)(**Table 1, Figure 1**)

TABLES AND FIGURES

Table 1 –Comparison Of Serum Zinc Levels (µg/Dl) In Between Cases And Controls

	Chronic tonsillitis cases	Controls
Serum zinc (µg/dl)	60.4 ± 10.9	98.16 ± 12.4
N	50	50
Mean age (years)	15.3	15.8

Figure 1-Serum Zinc Levels In Cases And Controls



Discussion :

Chronic Tonsillitis is a state of chronic inflammation . This is characterized by In our study , serum zinc levels were significantly decreased($p<0001$) in cases of chronic tonsillitis as compared to controls. Zinc is an structural and functional element. Its deficiency is associated with recurrent and chronic infections.

The antioxidants have a role in the pathogenesis of chronic tonsillitis. Free radical attack has been linked to numerous pathological conditions in all organs of the body, such as inflammation and infections. Reactive oxygen species are generated endogenously by inflammation and lipid peroxidation. Low antioxidant levels may predispose to a negative influence on the immune system.

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Our study shows that zinc is needed for normal human functions, whose deficiency leads to acute and chronic infections . Its deficiency also leads to decreased lymphocyte proliferation and reduced cytotoxic activity. Oral zinc supplementation may improve immunity and reduce frequency of infections.

Conclusion

This study shows that low zinc levels increases the susceptibility to infections. Oral zinc supplementation may help in improving immune status and reduces incidence of chronic infections.Further studies are necessary to estimate a possible therapeutic role of antioxidants, especially, dietary supplementation with zinc in preventing chronic tonsillitis.

Acknowledgement : I would like to thank my teachers, my family for their constant guidance and support throughout the study.

Source of support : Nil

Conflict of interest : None declared

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