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Original Research Article

Serum copper, zinc & magnesium levels in asthma patients

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ABSTRACT

Background & Methods: In our study we have 50 patients, matured 10-65 years, with asthma in moderate or serious stages, and whereas 25 healthy controls. Asthma is a multifactorial infection and its seriousness fluctuates with the incendiary evaluation. The subjects of serum concentration of Zn, Cu, and Mg were estimated by means of semiautoanalyser after data findings & clinical assessments at Saraswati Medical College, Unnao, U.P.

Results: 25 Healthy cases 44% are Males whereas 56% are Females, & in patient category 48% were males & 52% were females. The Mean levels of Serum Mean & SD of Magnesium concentration of patients was $131.5 \pm 24.7 \mu\text{g/L}$ where as Healthy were $131.3 \pm 19.3 \mu\text{g/L}$. Mean & SD of Copper concentration of patients was $1021.9 \pm 188 \mu\text{g/L}$ same Mean value with healthy were $1021.9 \pm 188 \mu\text{g/L}$. Mean & SD of Zinc concentration of patients was $1013 \pm 178 \mu\text{g/L}$ where as Healthy were $957 \pm 284 \mu\text{g/L}$. Zn & Mg in patients among allergic asthma were lesser as compared than in the healthy control group

Conclusions: In our study we found the Low levels of trace elements, mainly Zn, may have a important role to play in the pathogenesis of allergic asthma, meanwhile the substitution of these elements may be a useful asthma patients treatment.

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1. Introduction

The expanded incidence of bronchial asthma & hypersensitive ailments involves concern. Injury & irritation in such cases might be an aftereffect of oxidative pressure. A strong cell reinforcement can act against irritation & forestall the subsequent tissue injury. The cell reinforcement protection needs proteins that demonstration in presence of minor components like zinc. observational investigations have demonstrated that diets low in cancer prevention agents, for example, zinc, selenium, magnesium, nutrient C are related with an expanded danger of asthma.^{1,2} The major trace elements such as selenium, zinc, copper, and magnesium have imunomodulatory effects and thus influence susceptibility and the course of a variety of infections. In early assessments of models of

experimental antigen challenge & clinical & preclinical findings, the levels of reactive oxygen species (ROS) were found to be significant, along with superoxide & hydrogen peroxide (H₂O₂). Continuous trial on models & clinical investigations of asthma show some inconsiderate connection between discontinuous inordinate oxidative cycles & different incendiary sicknesses, particularly asthma.³ This assessment features both the unpredictable etiology of human asthma & issues with the researched minor components. The Components of Cu, Mg, & Zn in sera of patients, Zn is an essential trace element acquired by dietary means, plays an essential role in modulating & regulating the immune system & response as well as acting as an antioxidant. While some reports described zinc deficiency in children with asthma, others described high and normal level. Asthma has been exhibited to include prolonged oxidative pressure, minor components, including copper (Cu), Mg, & zinc (Zn) have been estimated to

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assume considerable functions in the pathogenesis of asthma. Nonetheless, critical relationships among their status & the commonness or seriousness of asthma exhibited in human.

2. Materials and Methods

The investigation was led was in 2018 at the SMC Medical College, Unnao, U.P, India. The selected populace included 50 unfavorably susceptible asthma patients & 25 controls between 10 & 65 years old. The examination was endorsed by the Ethics Committee of SMC of Medical College, Unnao, U.P, India, & all subjects marked educated assent structures. They all satisfied the models of industrious asthma dependent on the asthma rules. The people with metabolic sicknesses, hunger, or chronicles of devouring nutrients or mineral enhancements were barred from the examination. The information included age, sex, family ancestry, & supplement utilization for both the sound control & patient gatherings. Sound people with chronicles atopy in their life, & patients with nutrient or mineral enhancement utilization since the principal asthma assaults were avoided. Since patients were alluded from various facilities, we needed exact patient chronicles & put together our data with respect to persistent articulations. Blood was gathered in plain bulb & prepared after our set up research facility convention.

2.1. Statistical methods

Results were organized in MS dominate sheet & factual examinations were done utilizing the accompanying techniques:

1. Descriptive measurements were utilized: for persistent variable reach, mean (\bar{x}) & standard deviation (sd) were determined & for straight out factors extent & rate were acquired.
2. Comparison between two example extents was finished utilizing the 2-example Z-test & P values were determined.
3. To think about between factors of at least three gatherings, ANOVA test was applied.

3. Results

Table 1: Report of patients and healthy subject details of number and gender, who were enrolled in this investigation

	Patients		Healthy
Sex			
Male	24 [48%]	Male	11 (44%)
Females	26 (52%)	Females	14 (56%)
Total	50 [100%]		25[100%]

In Table 1, it reveals that among 25 Healthy cases 44% are Males whereas 56% are Females, & in patient category

48% were males & 52% were females.

Table 2: Mg, Zn, and Cu concentrations in sera of allergic asthma patients and healthy control groups

Concentration in sera (mean \pm SD) ($\mu\text{g/L}$)		
1)	Patients	Healthy
2) Mg	131.5 \pm 24.7 $\mu\text{g/L}$	131.3 \pm 19.3 $\mu\text{g/L}$
3) Cu	1021.9 \pm 188 $\mu\text{g/L}$	1021.9 \pm 188 $\mu\text{g/L}$
4) Zn	1013 \pm 178 $\mu\text{g/L}$	957 \pm 284 $\mu\text{g/L}$

In Table 2 which depicts the Mg, Zn, and Cu concentrations in sera of allergic asthma patients and healthy control groups, Mean & SD of Magnesium concentration of patients was 131.5 \pm 24.7 $\mu\text{g/L}$ where as Healthy were 131.3 \pm 19.3 $\mu\text{g/L}$.

Mean & SD of Copper concentration of patients was 1021.9 \pm 188 $\mu\text{g/L}$ same Mean value with healthy were 1021.9 \pm 188 $\mu\text{g/L}$.

Mean & SD of Zinc concentration of patients was 1013 \pm 178 $\mu\text{g/L}$ where as Healthy were 957 \pm 284 $\mu\text{g/L}$.

4. Discussion

No big difference was found for serum mg fixations between solid controls & patients with hypersensitive asthma in our investigation, outcome of past reports that found no distinctions in serum mg focuses between asthmatic patients & fit people.⁴⁻⁶ The information demonstrated no distinction in serum mg fixations between moderate & serious asthmatics. Outcomes of Sera of Cu has no impact on unfavorably susceptible asthma seriousness, whereas Zn concentration focuses were essentially lower in patients as compared to in controls cases, albeit no relationship was found between Zinc & sickness seriousness. Lower levels in patients with unfavorably susceptible asthma in Zinc rather than in controls, however no distinction was seen between patients of asthma with moderate & extreme, so we infer that Zn lack may have a function in asthma beginning however not movement.^{4,7} Zn is a significant minor component & its fixation is as often as possible used to assess incendiary sicknesses.⁸ Besides, numerous investigations have detailed that that Zn lack can prompt an assortment of difficulties, including development impediment, deferred wound mending, constant looseness of the bowels, & expanded helplessness to contaminations.⁹ It can likewise upset the balance between types 1 & 2 T aide cells, which causes expanded aggravation; a similar instrument distinguished in unfavorably susceptible aviation route excessive touchiness.¹⁰ Various clinical examinations have connected an expansion in the frequency of asthma with low dietary Zn consumption. Noteworthy reductions in serum, plasma, & hair Zn levels have additionally been accounted for in some asthmatic people.¹¹ In this way, it is recommended that the insufficiency of Zn

may diminish cancer prevention agent work & lead to expanding danger of bronchial asthma. In the current study, serum zinc was found to be elevated while serum copper levels were lowered in the patients.¹² Cu/Zn-SOD is a cancer prevention agent compound that contains Cu as a fundamental part. Our information demonstrated that the Cu focus in patients with unfavorably susceptible asthma was higher than that in the sound benchmark group, especially in females. Some past examinations showed that high Zn serum fixations can prompt decreases in both Cu/Zn-SOD & Cu focuses, as Cu inadequacy can mirror a high Zn focus.¹³ There are controversial reports regarding changes in serum level of zinc and Cu in asthma. It was reported that serum zinc concentrations decreased, and serum copper concentrations increased in asthmatics and the Zn/Cu ratio were decreased.^{14,15} As a consequence, the high serum Cu fixations in patients in this assessment are additional proof of Cu Zn threat in the way physiology of asthma. Supplementary investigations led on intervention to change minor component level fundamental structure work changes in asthma & in particular in serious asthma, are expected to characterize the way physiology & organic chemistry of asthma.

5. Conclusion

In our study we found the Low levels of trace elements, mainly Zn, may have a important role to play in the pathogenesis of allergic asthma, meanwhile the substitution of these elements may be a useful asthma patients treatment.

6. Source of Funding

None.

7. Conflict of Interest

The authors declare no conflict of interest.

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