

ORIGINAL ARTICLE

Prophylactic Use of Copper Sulphate in Various Skin and Eye Diseases of Humans

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ABSTRACT

Copper is a basic requirement of human body in various metabolic functions. Because of its numerous risky effects its beneficial role is difficult to find in studies but its deficiency and total depletion in body affect many copper dependent functions that may disturb the whole body. This descriptive observational study was conducted in Hazurpur village, District Sargodha from 2010 to 2021. Total 400 study participants of age range 5 to 60 years were enrolled. All individuals belonged to same area with same residential facilities. All members were divided into two equal groups, as case (n=200) and control (n=200). Males and females were also equal in all age groups of case and control sets. Consent was taken verbally from adults (18-60 years) and from parents of age group 5-17 years. Case group individuals took copper sulphate crystals orally with 250 ml (1 glass) milk once in a week with dose of 1µg/kg body weight. Control group did not take any drug/crystals. Amongst 200 case members, only 1.5% developed eye and skin infection while 57% of individuals from control group acquired these infections (p-value .0016). No children were affected by skin or eye disease from case group while 16% young cases got eye and 15% developed skin infection. The prophylactic benefit of copper sulphate has been reported firstly. There must be a public awareness programs for the therapeutic use of copper sulphate.

KEYWORDS: copper sulphate, skin and eye diseases, prophylactic effects

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INTRODUCTION

Copper is a vital mineral that keeps the human body healthy by various metabolic processes. Different studies have been done for various therapeutic uses of copper in humans like as antibiotics, for prevention of muscular abnormalities, for treatment of anemias and its use by oncologist has also been established [1,2]. Even though minerals are used in small amounts in body but its dynamic function in enzyme and hormone production cannot be ignored that affects the overall growth of several human vital systems [3].

The adult healthy human body contain 1.4 to 2.1 mg of copper per kg body weight, hence to remain healthy copper should be in human diet in trace amount. It helps to maintain strong metabolism, promotes effective bone development and ensures nervous system to work appropriately. Copper is found more in organs with high metabolic activity. Copper is also used as medicine in some bacterial, fungal and parasitic infections as well as in chronic inflammatory diseases and in cancers [4,5].

The use of copper sulphate in trace amount is running in families as custom by various groups of people. As copper is essential for neuro development so these people relate its useful effects in childhood and also taking copper sulphate prophylactically for better eye sight and in prevention of multiple dermatological disorders [6,7].

The use of copper in controlled quantity is very important because its excess in body can cause variety of health hazards by its accumulation in different parts of body. Previously copper was used to sterilize chest open wounds and to purify water but with advancements in knowledge its medicinal use is flourished. Although it is used by different farmers as fungicide and veterinary doctors for animals but its use in human is limited and can cause environmental pollution [8,9].

No much data has been known about its prophylactic use in human diseases. This study established the rationale use of copper in preventing many skin and eye ailments.

MATERIAL AND METHODS

Voluntarily 400 healthy individuals were taken and separated in 2 groups, each comprises of 200 participants as case (n=200) and control (n=200) respectively. Consent was taken verbally from all adult individuals (> 18 years) and from their guardians of young ones (5-17 years). Individuals with age less than 5 years, pregnant females and all those who were not interested to take part in study were excluded from the research. Males and females were equal in both groups. All the beneficial and side effects of copper sulphate in humans were explained to adult participants and guardian of children. Qualitative and quantitative variables were noted in both study groups like age (years), height (inches), body weight (kilogram) and body mass index. The members of case group were advised to take copper sulphate crystals with 250 ml (1 glass) milk after meal. The dose was 1 µg / kilogram of their body weight similar to the size of 1 quarter millet seed. Side effects was asked after taking copper sulphate but only few complaints of nausea with vomiting after few hours because of its irritable effect on stomach. As copper is metal so its metallic taste was experienced for one day by many individuals. All were advised to take it after meal and none of them disobeyed. The participants of control group did not ingest copper sulphate. All the members of both case and control group lived in similar ecological condition with uniform facilities of eating. Water supply was also same for both groups.

STATISTICAL ANALYSIS:

The SPSS version 20 was used for data analysis. Mean and standard deviation (\pm SD) was calculated for continuous variables; while frequency and percentage were mentioned for categorical variables. P-value $\leq .05$ was considered statistically significant.

RESULTS

Males and females were equal in both case (n=200) and control (n=200) groups. Distribution according to age in both groups is described in Table 1 with significant p value (.05). Mean age (\pm SD) for case and control group was 32.35 ± 15.07 and 31.3 ± 14.49 respectively; while height (64.3 ± 3.81 inches), weight (case= 62.94 ± 15.25 , control= 62.28 ± 14.85 kilogram) and Body Mass Index (BMI, case= 23.6 ± 8.6 , control= 23.3 ± 8.45) was almost similar in both sets. Children of both groups didn't develop any skin and eye disease while 16 % (32) children and 12.5 % (25) adults acquired ophthalmic infection from control group. Control group also developed dermatological disease in 30 (15%) children and in 27 (13.5%) adults given in Table 2 with significant p-value (.0016).

Table1: Age Distribution of Cases and Control Participants (n=400).

Age	5-18 years (%)	19-40 years (%)	41-60 years (%)	Total
Cases (n=200)	50 (25)	80 (40)	70 (35)	200
Controls (n=200)	50 (25)	90 (45)	60 (30)	200

Chi-square= 1.35, p-value=.50

Table 2: Frequency Distribution of Eye and Skin Diseases in study participants (n=400).

Groups	Cases (n=200)		Control (n=200)	
	Eye Infectivity	Skin Diseases	Eye Infectivity	Skin Diseases
Males	None	02	35 (17.5)	33 (16.5)
Females	01	None	22 (11)	24 (12)
Total (%)	01 (0.5)	02 (01)	57 (28.5)	57 (28.5)
	3 (1.5)		114 (57)	
Chi-sq	0.338		9.87	
p-value	.56		.0016*	

(*p-value \rightarrow highly significant)

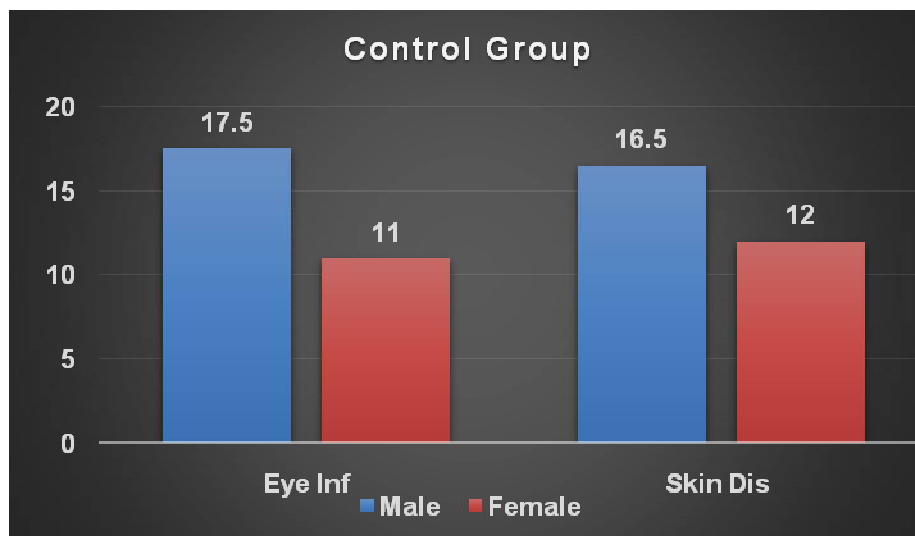


Figure 2: Frequency of Eye Infection and Skin Diseases in control group (n=200).

DISCUSSION

Copper is an essential micronutrient that takes part in the normal growth of central nervous system. Many diseases associated with copper like Wilson disease and multiple neurodegenerative disorders. Small amounts of copper must be taken in diet to prevent its shortage that directly or indirectly affects very vital steps of metabolism. Good feeling in mood was noted by some of the participants in case group and it is supported by an advantageous study done by Slupski document that use of copper sulphate can change the mood and it can be used as antidepressant [7].

Veterinary doctors also document the useful therapeutic effects of copper in animals in spinal cord injury due to ischemia [10].

A study done by Rademaker et al observed the beneficial role of copper sulphate combined with hot spring water in patients suffering from eczema [11].

It has been documented that bacteria, viruses and different microbial organisms are rapidly killed on metallic copper surfaces therefore the term “contact killing” is joined with this phenomenon. Thus to limit the spread of organisms from surfaces, metallic copper surface is now encouraged to use in medical care centers [12,13]. Copper does not react with hot water unlike iron, so its use in making hot water tanks is also documented. Since decades its use as medicine in different diseases like anemias, skin diseases, osteoporosis and to prevent cardiovascular disease is well known [14,15].

LIMITATIONS

Levels of copper in serum was not observed in any participants but fortunately no case of over dosage was noticed.

CONCLUSION

The use of copper in small amount was seen beneficial especially for prevention of skin and eye diseases. Limited data is available on its medicinal use and need more strengthening of studies in humans.

ETHICAL DECLARATION

All procedures followed were in accordance with the ethical standards of the responsible committee on human experimentation (institutional and national) and with the Helsinki Declaration of 1975, as revised in 2000. Informed consent was obtained from all patients for being included in the study.”

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CONFLICTS OF INTEREST: None.

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