

THE EFFECT OF ZINK SUPPLEMENTATION FOR GROWTH DEVELOPMENT IN CHILDREN

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ABSTRACT

Introduction: Zinc deficiency occurs in many creating countries, especially in children up to women of reproductive age. Zinc is closely related related to height growth and function of the body. Cooperate of zinc with critical hormones included to bone Growth and centralization in the bone grid is high contrasted with different networks. Insuficient blood levels of zinc in the body in children can affect a child's growth. **Methods:** The method used by the research journal PubMed and BMJ. adapted to the journal search and limited research topic of the year 2011-2017. **Result:** Zink deficiency can affect on growth development in children. Given zinc supplementation in children can affect a child's growth. **Conclusion:** Children with zink deficiency can affect the growth of children up to 18 years. Supelemtasi zinc can affect bone metabolism and growth hormones that are needed by infants and young children in developing countries particularly vulnerable to zinc deficiency. Zinc deficiency can also lead to low body height in children.

Keywords: zinc, deficiency, growth, child, height, weight, zinc supplement.

INTRODUCTION

Insufficient blood levels of zinc in the body including a case that resulted in the most widespread micronutrient loss. People of all ages are at risk, ranging from children to women of reproductive age are at high risk of zinc deficiency, mainly in low-income countries (Petry 2016).

Growth and development is a continuous process from conception to age 18 years. Components of nutritional are among the factors that determine and plays an important role in the growth and development of children. Children need more intake of zinc to obtain normal growth and development (Leon 2009).

Zinc (Zn) is a structural constituent that is essential for cell growth, proliferation and differentiation. Zinc has 3 main basic functions: to catalyze action of the enzyme, provides for participation the component of proteins, and control gene interpretation. Specific symptoms of Zinc insufficiency, such as growth retardation, diarrhea, Postponed puberty, glossitis, erectile dysfunction, nail dystrophy,

alopecia,immunity decreases, and hypogonadism on men (Hwan, Lee, Kim 2016).

Zinc is closely related to height growth and function of the body. Cooperate of zinc with critical hormones included to bone Growth and centralization in the bone grid is high contrasted with different networks (Abdollahi 2014) . Infants and children who have Zinc insufficiencywould be vulnerable to impaired height growth and function of the body (Petry 2016).

The purpose of this researchmight have been on perform literature review competency of midwives inthe treatment of children with zinc deficiency through supplementation with zinc to reduce the incidence of zinc deficiency and the consequences that occur.

METHODS

The search strategy study of the english language that are relevant to the topic conducted using PubMed and BMJ restricted from January 2011 to December 2016. Keyword used were zinc, deficiency,

growth, child, height, weight, zinc supplement. Full text articles and abstracts were analyzed to choose studies that fit the criteria. Consideration standards used for review was the impact of zinc for growth development in children.

The research examined in this article using the treatment group and the control group of the respondent to the treatment of children with zinc deficiency.

Gier et al. (2015) showed that several studies conducted on school children in Cuba and Cambodia using analysis of height to STH infections and plasma as well as hair zinc. The research in Cuba there is no relation between the effect of STH with the child's height by age views of hair zinc. but in Cambodia indicate that there is relation between plasma zinc with the child's height by age.

The study by Hamzah, Hamed, Sallam (2012) in fifty children of Egypt pre-pubertal height lower and Zn deficiency showed that the levels of serum IGF-1 and IGFBP-3 are low and supplementation Zn for 3 months did not can increase the serum used to increase the growth of children. So that Zn supplementation to children in need in the long period of time, thereby increasing serum growth in children.

Results from Dehghani (2011) in Shiraz- Iran explained that there might have been no huge correspondence between zinc levels on children with weight (BMI), height, but the incidence of gentle wasting also short stature. were relevant higher light

is found over kids with insufficient blood levels of zinc. Contrasted in kids with ordinary alternately large amounts of zinc.

El-Shazly (2015) showed that the BMI and zinc serum was higher on men over women, in any case there might have been no significant correlation between levels of zinc with sex. there is a significant relationship between zinc supplementation in children with BMI. and provision of zinc supplements can improve appetite in children.

Results of research conducted Abdollahi et al. (2014) concluded that zinc supplementation clinched alongside know youngsters under 5. A long time of age can affect linear growth of children, especially in developing countries. but the effect of zinc supplementation when given in 7:03 months duration and dose range 1-20 mg / day.

Tae Hwan (2016) in Seoul Hanyang University Hospital expressed about the role of micronutrient deficiencies, especially zinc. Zinc deficiency is known to affect bone metabolism. the contribution of zinc in the growth can be explained by the participation in the synthesis of DNA. Zinc has a direct effect on the hormonal system of primary (IGF-I / GH) control of linear growth in children. Zinc supplementation will produce a positive impact when given to children who proved with zinc deficiency.

RESULTS & DISCUSSION

No	Title	Author/year	Design	Population and Sample	Intervention	Control	Random	Outcome	Result
1.	Height, Zinc Furthermore Soil- Transmitted helminth Infections to Schoolchildren: An investigation in cuba and cambodia.	De Gier <i>et al.</i> 2015	Carried out a cross-sectional study	1389 Youngsters from 13 haphazardly chose schools clinched alongside cuba and. Starting with 20 haphazardly chose schools were included 2471 in cambodia.	Investigated gathered information once height, STH contamination Also zinc centralization Previously, Possibly plasma (Cambodia) or hair (Cuba).	No	Yes	Cooperations between tallness to Age, Zinc and sth spoiling.	Relapse investigation indicated An huge negative affiliation between sth contamination Furthermore tallness to period and in addition over zinc hair However sure companionship (aB-0. 471, p = 0. 033) might have been found between hair zinc Also tallness to agen.
2.	Impact for zinc supplementation around Growth hormone insulin response Growth component hub in short egyptian kids with zinc lack.	T Hamza R , I Hamed A, T Sallam M. 2012	Cohort	50 pre-pubertal egyptian [27 guys and 23 females whose ages went between 3. 2	Auxological appraisal Also estimation from claiming serum Zn, IGF-1, insulin response development figure tying protein-3	Yes	No	supplementationof Zinc might make huge expands in stature standard deviation score (SDS,	After 3 months for Zn supplementation for Zn-deficient patients, there were Zn rose On the whole patients Be that arrived at typical ranges On 64 %, IGF-1 levels rose over 60 % yet all the arrived at typical ranges to 40 % What's

				Furthermore 10.9 years.know youngsters for short stature and Zn lack	(IGFBP-3); and basal Furthermore invigorated GH previously, then 3 months then afterward Zn supplementation (50 mg/day).			P = 0.033), serum Zn (P < 0.001), IGFBP-3 (P = 0.042), IGF-1 standard deviation score (SDS,P < 0.01) and IGF-1 (P < 0.01)	more IGFBP-3 levels rose for 40 % in any case arrived at reference ranges for 22 %. Development speed (GV) SDS didn't contrast the middle of situations Also controls (p=0.15) At might have been higher Previously, GH-deficient patients over non-deficient ones, both Hosting Zn lack (p=0.03).
3.	Predominance of Zinc insufficiency for 3-18 a considerable length of time old kids in Shiraz-Iran.	S M Dehghani <i>et al.</i> 2011	Carried out a cross-sectional study	902 Youngsters age-old 3-18 a considerable length of time of age were haphazardly sampled for serum zinc level.	Sex, weight, age, and height were all recorded. ask permission to the parents and to take blood samples of 4-5 mL for measurement of their serum zinc level	No	Yes	Age, sex, weight, and height no significant with zink deficiency	There might have been no huge Acquaintanceship between zinc insufficiency and age, gender, weight, tallness. Those predominance for zinc lack might have been 10.2%, 7.8%, 4.8%, Also 5.8% for underweight, ordinary weight, at danger for overweight and overweight, separately (p=0.207).

									However, the predominance from claiming gentle wasting Also hindering might have been fundamentally higher in zinc inadequate Youngsters contrasted with kids for ordinary or helter skelter zinc level.
4.	Effect of zinc supplementation on body mass index and serum levels of zinc and leptin in pediatric hemodialysis patients	El- shazly <i>et al.</i> 2015	Eksperimental	Led on 60 know youngsters the middle of 5 Furthermore e 18 a considerable length of time of age once general HD during the pediatric dialysis units, Menoufia school doctor's facilities. and Benha college.	Patients were haphazardly partitioned under two groups: i assembly i (supplemented group, n=40) gained zinc sulfide supplementation, What's more gathering ii (control, n=20) accepted placebo (cornstarch capsules) twice Every day to 90 times.	Yes	Yes	There might have been an expand On serum zinc level What's more BMI Also diminished serum leptin after zinc supplementation over kids.	Zinc supplementation brought about An critical build in intend serum zinc level Also BMI. Serum leptin diminished essentially then afterward supplementation done kids. A critical negative correspondence might have been watched the middle of serum zinc What's more leptin levels Likewise an aftereffect for zinc supplementation..

5.	Oral Zinc Supplementation Positively Affects Linear Growth, But not Weight, in Children 6-24 Months of Age	Abdollahi <i>et.al.</i> 2014	Multistage randomized sampling design	393 Also 445 Youngsters 6-24 months of age.	Kids for both Assemblies accepted schedule iron What's more multivitamin alternately vitamin An What's more d supplements through PHC administrations . Moms of kids in the mediation bunch were required will provide for a single dosage of 5 ml/day zinc sulfide syrup (containing 5 mg natural zinc) should their Youngsters for 3 months same time Youngsters in the control gathering didn't	Yes	Yes	Oral zink supplementation viable for expanding straight Growth rate of Youngsters.	Anthropometric estimations were performed In benchmark and around An month to month groundwork done both gatherings. Found that An 0. 5 cm distinction in the stature increase in the mediation aggregation Similarly as compared with the control (P < 0. 001). Zinc supplementation needed no impact around weight increase for kids.
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6.	Hair Zinc Level Analysis and Correlative Micronutrients in Children Presenting with Malnutrition and Poor Growth	Tae Hwan, Lee Jin, Kim yong.2016	Cohort	56 pediatric patients (28 males and 28 females age, 1-15 years) presenting with anorexia, malnutrition, poor growth, poor appetite, with/without other GI symptoms (diarrhea, abdominal pain, constipation)	Biochemical studies for major micronutrients and macronutrients Were additionally directed furthermore hair mineral analyses.	No	No	The major clinical manifestation of zinc deficiency is poor body growth.	Calcium. (r=0. 564, 0. 339, p=0. 001, 0. 011). Hair calcium level might have been associated with serum pre-albumin (r=0. 423, p=0. 001). Furthermore Standard of hair zinc were Exceptionally associated for serum vitamin d (r=-0. 479, p=0. 001), which likewise demonstrated connection with hair levels about first mass of the magnesium Furthermore calcium. (r=0. 564, 0. 339, p=0. 001, 0. 011). Hair calcium level might have been associated with serum pre-albumin (r=0. 423, p=0. 001).

Research that has been explored in these article indicate that zink deficiency can affect on growth development in children. Given zinc supplementation in children can affect a child's growth. However, administration of zinc must regularly and within a span of time

CONCLUSION AND RECOMMENDATION

Conclusion

The results of the literature review on the research that has been done on the 6 articles about the effect of zink in children so that it can be concluded that children with zink deficiency can affect the growth of children up to 18 years. Zinc supplementation can affect bone metabolism and growth hormones that are needed by infants and young children in developing countries particularly vulnerable to zinc deficiency. Zinc deficiency can also lead to low body height in children.

Recommendation

To prevent and reduce the number of zinc deficiency in children should be the provision of zinc supplements on a regular basis with a certain dose in the long term.

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