

The Association of Intestinal Parasites with Serum Zinc Level among primary school Children in Iraq.

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Abstract

Objective: Zinc is an active element in the body and behaves as a co-factor for many enzymes, so the aim of this study was to investigate the association between intestinal parasites and serum zinc level in children in Iraq, and the effect of parasitic infections on the nutrition, growth, and physiology of host is still poorly understood.

Subject & Methods : Stool samples was taken from 40 primary school children in al –sabeeb –abkar in Baghdad city (zam zam school children) 20 of them was boys and 20 was girls, testing for intestinal parasitic infection from the period form 10/2008 to 5/2009, then blood samples was taken from each child for measured serum zinc level by atomic absorption spectrophotometer.

Results Conclusion: 17 patients presented more than one species of intestinal parasites, 9 of them was boys and 8 was girls, No significant deferences was recorded between them .*Giardia lamblia* was fond in 6 (15%) child, *Entamoeba histolytica* found in 5(12.5%) and *Entamoeba Coli* was found in 2(5%). But *Enterobous vermicularis*, *Blastocystis hominis* was found in 3(75%), 1(2.5%) respectively.

The mean of serum zinc level of parasitic infected children was lower (71.06) than that of control (91.61) also the weight and height, there was significant differences between infected and free parasitic children with serum zinc level.

Free children was higher (31.89kg) (109.78cm) than that of parasitic infected children (28..24kg) (100.59cm)respectively ,but there was no significant difference between them.

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Shatha Q.Jawad , Ahmed J.Al-Bayatti , Nagam Q. Jawad,

We need further investigation in bigger groups for elucidate the role of zinc and –or other Biochemicals in the serum of parasitic infected children in Iraq, for determine the main factors influencing the occurrence of infection, promotion of environmental sanitation for the affected areas

Introduction

Intestinal parasites are a magor public health problem ,In 2002,WHO,estimated the number of people infected by digestive tract parasites at3.5 bilion and the number of people made ill by them at450 million⁽¹⁾.

Intestinal protozoa, the third –greatest parasitic disease responsible for the death in the world after malaria & schistosomiasis, and the world wide prevalence among children under 10 years of age ⁽²⁾.

These infections (the majority being children)are regarded as serious public health problem, they can cause iron deficiency anemia, growth retardation in children and other physical and mental health problems ⁽³⁾.

Low levels of education, poor hygiene, poor drinking water, over crowded conditions, and poor sanitation increase the prevalence of giardiasis ⁽⁴⁾.

Zinc deficiency is another increasing public health problem, In 2004 its global prevalence was estimated at31% ranging from 4% to 73% across developing countries the association between zinc deficiency and infection has scarcely been investigated⁽⁵⁾. Although the association of *G.intestinalis* with malnutrition and malabsorption of micronutrients such as vitamin A) is well recognized ⁽⁶⁾.

In 1993, giardiasis was reported as a first-time risk factor for zinc malabsorption in children, their other authors reported this risk however, the link remains controversial ^(7, 8).

Material & Methods

Stool samples (0.5-1.5g) of 40 primary school children in the third year,20 of them were boys and 20 of them were girls ,were collected in labeled plastic containers without preservatives and immediately(less than 2 hr.) examined on microscope, to check the consistency and point out the presence of blood,mucus,or adult helminth parasites, at the period from October 2008 to May 2009.

We performed the modified formalin-ethyl acetate sedimentation technique for all specimens to demonstrate the presence of worm eggs and larvae and protozoan trophozoites and cysts ⁽⁹⁾. Also height and weight were measured for all children.

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Shatha Q.Jawad , Ahmed J.Al-Bayatti , Nagam Q. Jawad,

<i>Enterobius. Vermicularis</i>	3	75
Total	17	42.5

$X^2=2.98$ $P=0.0224$ $P<0.05$ (Significant)

Table 3: Zn and weight & height levels in parasitic infected children and control group of children.

Variables	Parasitic infected children Mean SD	Control group children free man Mean \pm SD
age (yr)	8.59/0.30	8.57/0.31
Weight (kg)	28.24/2.12	31.89/2.63
Height (cm)	100.59/9.33	109.78/10.86
Serum zinc Level mg/dl	71.06/21.6	91.61/26.89

$t\text{-test}=2.36$ $P=.0.043$ (Significant)

Discussion

The study aims to evaluate the spread of intestinal parasites in children, particularly the school children. The study showed the presence of intestinal parasites about, this percentage regarded rather high among the school children, and there was no difference between boys and girls with the infection, which have nearly the same rate.

Intestinal parasites represents a relevant clinical problem especially in developing

Countries, where they are responsible for morbidity and mortality in adults or children, and the epidemiological data are available for these areas⁽¹¹⁾.

It is believed that the spread of the intestinal parasites has great relation to the financial and educational level of the families particularly in regions suffering from trouble.

Intestinal parasitic infection may cause damage in the intestinal mucosa, such as inflammation, ulceration, and pathological changes in the villi of epithelial cells in the acute period of infection, and during the chronic period of the pathology, the epithelial cell damage and intestinal abscesses have also been reported⁽¹²⁾.

There is no practical and reliable study in Iraq showing the real causes of the wide

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Shatha Q.Jawad , Ahmed J.Al-Bayatti , Nagam Q. Jawad,

spread of the intestinal parasites, or the way of treatment of the causes, besides there is no study showing the effect of these parasites or the relationship between of these

Parasites and the elements of blood serum (chemicals), as a matter of fact no study showed the effect on the health or the growth of the body⁽¹³⁾. To prove that, the study showed a low level of zinc in children having these parasites in comparison with children who do not have the intestinal parasites and in children malnutrition contributes to an increase in the risk of enteroparasite infections which are causally associated with a chain of events involving anorexia,⁽¹⁴⁾.

There are limited studies in human concerning zinc level with the parasite infection in

Adult or in children but most of the studies are epidemiological, as studies on parasitic infection of children focused on nutritional and growth status, the results of these studies are contradictory about the effect of parasitic infection on the growth status of children, some authors found that these infections are related to the growth retardation while others reported no relationship, Kurpad et al, reported that the intestinal infection with parasites increases the requirement for lysine and this may be one factor responsible for the higher lysine requirement observed in persons with chronic under nutrition⁽¹⁵⁾.

We showed that one type of the intestinal parasites may be a risk factor for zinc deficiency in school children under poor socioeconomic and environmental condition that accepted with many studies⁽¹⁶⁾.

This attempt needs wider study on a larger number of school pupils and more specific and practical study to discover the real causes which affect the growth of children.

Reference

1. WHO. Burden of disease in disability adjusted life years (daly s) by cause, sex and mortality stratum in wHo regions. Geneva: WHO. 2002
2. Voigr, H.; Olivo, g.c.; Sansoneti, p.; Guillen, N. Nyosin IB From *Entamoeba histolytica* is involved in phagocytosis of human erythrocytes. g. cell. sciences 1999 112:1191-1201.
3. Kim,BI.;Ock,M.S.;Chung,DI.;Yong,t.s.; Lee, K.i. Intestinal parasite infection status of Inhabitants in the Roxas city, the Philippines Korean. 2003 G. Parasitol.

The Association of Intestinal Parasites with Serum Zinc Level among primary school Children in Iraq.....

Shatha Q.Jawad , Ahmed J.Al-Bayatti , Nagam Q. Jawad,

4. Ratanapo, S.; Mungthin, M.; Soontarapa, S.; Falshed, C.; Sripatanapipong,S.; Pangsins, R.; Naaglor,t.; pyaray, p.; Taamas, s.; Leelayoova,s. Multiple modes of transmission of Giardiasis in primary school children of a rural community, Thailand. 2008 Am. G. Clin.Nutr.78 (4) :611-615.
5. Caulfied, L. E.; Black, R. E. Zinc deficiency, Global & regional burden of disease Attributable to selected magor risk factors companative quantification of health risk World health organization.Geneva. Ezzat,m.lopez, ad, Redegers, A.; Murray. 2006 c.i.257-279
6. Bluta,Z.A Effect of infection and environmental factors on growth and Nutritional status in developing countries.J.Pediatr Gastroentero .Nutr. 2006 43:
7. Eram, P.; Yerei, K.; Kurt, O.; Balcioglu, C.; ORag, A Serological levels of zinc,copper and iron elements among Giardia lamblia infected children in turkey. Rediatr. In. 2002.44 (3):286-288.
8. Peruzzi, S.; Gorrini, C.; Piccolo, G.; Calderaro, A.; DEtori, G.; Chezzi, c. Prevalence of intestinal parasites in the area of pama during the year 2005.Acta. Biomed.2006. 77; 146-151.
9. Garcia,L.S. and Ash ,L.R. Diagnostic parasitology.clinical laboratory manual. C.V.Mosby company. St.louis. 1975
10. Sorlie, D.E..Medical biostatistics and epidemiology.Postgraduate docor-Middle east1995 .9(7): 412-418.
11. Sa ldiva, R M.; Carvalbo, H B.; Castilbo, V P.; Struchiner ,C L.; Massad, E. Malnutrition and susceptibility to enteroparasites reifection rates after mass Chemotherapy .Paediatr .perinat. Epidemiol2002. 16(2):160-171.
12. Sa ldiva, R M.; Carvalbo, H B.; Castilbo, V P.; Struchiner ,C L.; Massad, E. Malnutrition and susceptibility to enteroparasites reifection rates after mass Chemotherapy .Paediatr .perinat. Epidemiol2002. 16(2):160-171.
13. Kyriazakis, I I, ; Tolkmapp, B I.; Hutchings, M R. Towards a functional explanation for the occurrence of anorexia during parasitic infection .Anim. Beha.1998. 56(2) :265-274.
14. Markel, E.;Voge,M.;Jhon,D I. Medical parasitology 7th edition .W B Sanunders co phile delphia . 1992. : 22-96.
15. Kurpad,A V.; Regan,J.; Young, M M; Nazareth, D.; Nagaraj, S.; Gnanon, J.;Young, V Intestinal parasite increase dietary lysine

The Association of Intestinal Parasites with Serum Zinc Level among primary school Children in Iraq.....

Shatha Q.Jawad , Ahmed J.Al-Bayatti , Nagam Q. Jawad,

requirement in chronically under Nourished Indian men. 2003. Am.J.Clin. Nutr. 78(6): 1145-51.

16. Valencia, M.; Mc neill,G.; Haggarty,P.; Moya,S Y.; Pinelli, A.; Quihui, L. Energec consequences of mild giardia intestinalis infestation in Mexican children. Am. J. Clin. Nut. 1995. 61. 860-865.

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Shatha Q.Jawad , Ahmed J.Al-Bayatti , Nagam Q. Jawad,

الخلاصة

الهدف : تهدف الدراسة الى تقدير ودراسة تأثير انتشار الطفيليات المعوية وعلاقتها بانزيمات المصل خاصة الزنك لثائره على صحة الاطفالولانه لا توجد معلومات في العراق اجريت هذه الدراسة .

طريقة العمل : تم فحص براز 40 طفل 20 منها ذكر و 20 انثى بعد اخذ كافة المعلومات المتعلقة بكل طفل وقياس الطول والوزن في مدرسة زمزم الابتدائية (في منطقة السبع ايكار-بغداد الرصافة) , لتشخيص الاصابة بطفيليات الامعاء ومن ثم تم قياس مستوى الزنك في المصل باستخدام Atomic absorption spectrophotometer

وبعدها تمت مقارنة مستوى الزنك في المصل بين الاطفال الذين لديهم اصابة طفيلية واحدة او أكثر و الذين لم تكن لديهم اي اصابة-مجموعة السيطرة للمدة 2008/10 الى 2009/5. **النتائج والمناقشة** ظهرت الاصابة الطفيلية في 17 مريض سواء كانت مفردة او مشتركة كان منها 9 ذكر و 8 انثى ولم يظهر اي فرق معنوي في الإصابة بين الذكور والاناث , ظهرت الجيارديا المعوية في 6 (15%) مريض واميبا الزحار في 5 (12.5%) , اما اميبا القولون كانت في 2 (5%) .

لكن الدودة دبوسية والكيسية الاريمية البشرية كانت في 3 (75%) و 1 (2.5%) على التوالي. بلغ معدل وزن وارتفاع الاطفال الذين لم تكن لديهم اصابة طفيلية 31.89كغم و 109.78سم بينما بلغ 28.24كغم و 100.59سم في الاطفال المصابين على التوالي.

كان معدل مستوى الزنك في مصل الاطفال الذين لم تكن لديهم إصابة طفيلية 91.61 وهو أعلى من مستواه 71.06 في الاطفال الذين كان لديهم اي نوع من الطفيليات المعوية, بينم لم يظهر فرق معنوي بين المرض الذين كان لديهم اصابات طفيلية والاطفال الذين لم تكن لديهم اي اصابة **التوصيات:** النتائج دلت على وجود نسبة عالية للاصابة بطفيليات الأمعاء بين اطفال المدارس, تحتاج الدراسة الى دراسات اخرى اوسع لتشمل مدارس اكثر ولمناطق متفرقة. لمعرفة الاسباب ومعالجتها اذ اعدت هذه الدراسة لتكون تمهيدية لدراسات مستقبلية فمن الضروري معرفة مستوى العناصر في المصل لدراسة تأثيرها على صحة الفرد وخاصة الاطفال في العراق .