THE EFFECT OF ENTERIC PARASITIC INFECTION ON SERUM ELEMENTS (COPPER) AND NUTRITIONAL STATUS ON EXPERIMENTAL ANIMALS (RABBITS)

AHMED JASIM ALBAYATI*
ALI S. HASAN**

*Dept. of Pathology College of Vet. Medicine - Diyala University, Iraq
**Dept. of General Hygiene - College of Vet. Medicine – Diyala University, Iraq

ABSTRACT

Copper is an active the body and behaves as factor for many enzymes, so the aim of this study was to investigate the association between intestinal parasites and serum copper level in experimental animals (rabbits). The effect of parasites infection on nutrition, growth physiology of host it is skill poorly understood.

KEYWORDS: Parasites, Copper, Rabbits.

INTRODUCTION

Intestinal parasites are a major public problem, in 2002, WHO, estimated the number of people infected by digestive tract parasites.(1) Intestinal nematodes and protozoa, the third greatest parasitic disease responsible of death in world after malaria and schistosomiasis, and the world wide prevalence among children under ten years of age.(2) These infections (the majority being children and animals) are regarded as serious public health problem on animals and children they can cause iron deficiency anemia, growth retardation in children and other physical and mental health problems. (3) Poor hygiene, poor drinking water (contamination) and overcrowded conditions and these create prevalence of giardiasis and nematode. (4) Copper deficiency is another increasing public health problem. The prevalence was estimated at 31% range from 4% to 73% across developing in countries the association between copper deficiency and infection has scarcely been investigated. (5) Although the association of G.intestinalis is well recognized. (6) Giardiasis was reported as a first-time risk factor for copper malabsorption in children and experimental animals there other author reported this risk however the link remains controversial (7,8).
Materials and methods:

Fecal sample was taken from 40 rabbits and the rabbits divided into two groups 20 male and 20 female and has being from internal parasitic infection from period 12/2014 to 7/2015. Then the blood samples were taken from each group for measure serum copper level by atomic absorption spectrophotometer.

Fecal samples from rabbits were collected in labeled plastic containers without preservatives and immediately examined on microscope to check the consistency and point out the presence of blood, mucus, or adult helminthes nematodes parasites, at period (12/2014) to (07/2015). Performed the modified formalin-ethyl acetate sedimentation technique for all specimens the presence of worm eggs and larvae and protozoa trophozoites and cysts. (9)

2 ml of sample of venous blood was taken from each animal rabbits using glass tubes, within 2 hr. blood sample carried to laboratory and centrifuged at 1200 cycle for 10 min. serum was separated labeled at 75c for waiting the copper determination by atomic absorption spectrophotometer, the statistical analysis was performed to study the association or the relationship between intestinal parasites infection and sex (male and female) and the intestinal parasites infection and serum copper level between the infected group and control group free from parasites test (10).

Results:

15 rabbits presented more than one species of intestinal parasites 8 males and 7 females. There is no significant differences were reduced between them. The nematode was found 7 (15%) in rabbits and Entamoeba histolytic found in 4 (12%) and Entamoeba coli was found in 3(5%) but enterobeous vermicular is 13, blastocystis was found in 4(7%), 2 (2%) respectively.

The mean of serum copper level of parasitic infection in rabbits was lower (70%) than that of control (90) also weight and height. there was significant differences between infected and not infected rabbits with serum copper level. Non infected rabbits were higher (5 kg) (70 cm) length higher than that of parasitic infected rabbits (3 kg) and length (60 cm) but there was no significant differences between. investigations in bigger group for elucidated the role of copper and other biochemical in the serum of parasitic infected rabbits.
15 of 40 rabbit was presented more than one species of intestinal parasites either single or mixed infection, 8 of them was male and 7 female no significant difference (p>.05) was recorded between male and female with intestinal parasitic infection (table 1).

As shown in (tab. 2) for the prevalence of intestinal parasites, nematodes 7 (15%) in rabbits, Entamoeba histolytica was found in 4 (12%), and Entamoeba coli in was found 3 (5%), but enterobious vermicularis and blastocystis was found in 4 (7%), 2 (2%) respectively.

The study showed no differences in the mean of serum copper levels and the mean infection and non-infected rabbits.

Table (1): Prevalence of intestinal parasites in the experimental animals (rabbits)

<table>
<thead>
<tr>
<th>Sex</th>
<th>Non experimented (control animals)</th>
<th>Non_infected animals</th>
<th>Prevalence rate %</th>
</tr>
</thead>
<tbody>
<tr>
<td>Male</td>
<td>20</td>
<td>8</td>
<td>22</td>
</tr>
<tr>
<td>Female</td>
<td>20</td>
<td>7</td>
<td>20</td>
</tr>
<tr>
<td>Total</td>
<td>40</td>
<td>15</td>
<td>42 %</td>
</tr>
</tbody>
</table>

$X^2 = 0.041 \quad P = 0.83 \quad P > 0.05 \; (\text{NS})$

Table (2): Species of parasites prevalence of intestinal parasites in the experimental animals (rabbits)

<table>
<thead>
<tr>
<th>Parasite species</th>
<th>Non-infected rabbits</th>
<th>Prevalence rate %</th>
</tr>
</thead>
<tbody>
<tr>
<td>Nematode</td>
<td>7</td>
<td>15</td>
</tr>
<tr>
<td>Entamoeba histolytica</td>
<td>4</td>
<td>12</td>
</tr>
<tr>
<td>Entamoeba coli</td>
<td>3</td>
<td>5</td>
</tr>
<tr>
<td>Enterobuus vermicularis</td>
<td>4</td>
<td>7</td>
</tr>
<tr>
<td>Blastocystis</td>
<td>2</td>
<td>2</td>
</tr>
<tr>
<td>Total</td>
<td>20</td>
<td>41%</td>
</tr>
</tbody>
</table>

**Discussion:**

The aim of the study to evaluate the spread of intestinal parasites in rabbits. The study showed that the presence of intestinal parasites about this percentage regarded rather high among the rabbits and there were no differences between male and female with infection, which have nearly the same rate. Intestinal parasites represent a relevant clinical problem in developing, Mortality in rabbits 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 education 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 cell in the acute period of the
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 widespread spread of the intestinal parasites, or the way to treat the causes, besides there is no study showing the effect of these parasites or the relationship between these, Parasites and the elements of blood serum as a matter of fact, no study showed the effect on the health or growth of the body (13).

To prove that, the study showed a low level of copper in rabbit with malnutrition contributes to an increase in the risk of enteroparasites infection which is causally associated with a chain of events involving anorexia (14).

There are limited studies in experimented animals concerning copper level with the parasite infection in the rabbits but the most of the studies are epidemiological as studies on parasitic infection of rabbits focus on nutritional and growth status, the result of these studies contradictory about the parasitic infection effect on the growth status of the rabbits, some authors found that these infections are related to the growth retardation while others reported no relationships reported that intestinal infection with parasites increases the requirement for lysine and this may be one factor responsible for higher lysine requirement observed in the persons with chronic undernutrition (15).

We showed that one type of the intestinal parasites may be a risk factor for copper deficiency in the rabbit’s poor nutrition and environmental condition that accepted with many studies, This attempt needs wider study on a larger number of experimental animals and more specific and practical study( 16 ) .

References