

Effect of Endo-Parasites Infection on Body Weight Loss and Blood Criteria of Under Ten Years Old Children

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ABSTRACT

The current study was conducted during the period 2023 by using 40 children (20 males and 20 female) from patient where visited AL-Najaf AL-Ashraf province hospitals (AL-Sadr and AL-Zahraa). The child's age from 8 – 10 years and the infection diagnosis was detected by Scotland tape. Samples were collected 5 ml from vein by using disposable syringes to do hematological tests (Hb, WBC, RBC, T.P and PCV). Results showed a significant difference ($P \leq 0.01$) among children were infected by *Entrobilus vermicularis* according age, the highest number was recorded in children with 5-10 years old while the less number was in children with more than 10 years old. Results showed a significant effect of pinworms infection on total protein content in blood, the total protein differ significantly ($P \leq 0.05$) in infected children with less than five years old (6.89 g/dl) compared with control (7.45 g/dl). Hemoglobin content differed significantly ($P \leq 0.01$) between infected and non-infected group; the blood content of hemoglobin was 10.91g/dl in control group compared with 8.87g/dl in infected group in children with less than five years of old. In children with 5-10 years of old, the hemoglobin content was 11.27 g/dl in control group while it was 8.51g/dl in infected group. Red blood cells differed significantly ($P \leq 0.01$) in children with more than 10 years old namely, 4.96 and 4.10 $10^6/\text{mm}^3$ in control and infected group respectively.

Keywords: *Endoparasites; Body weight loss; blood criteria*

INTRODUCTION

Entrobilus vermicularis was The first description of *Entrobilus vermicularis* is in 1758 by Karl Linnaeus, who firstly called it *Oxyurisvermicularis* (Gillespie and Pearson, 2001), the disease was also called oxyuriasis in past years. *Entrobilus vermicularis* classified as the oldest parasite defined and was identified in ancient Egyptian mummified human remains in addition to DNA samples from ancient human coprolite remnants from North and South America (Satoskar et.al., 2009). A second species of *Entrobilus vermicularis* that infect humans *E. gregoi* was described by Hugot in 1983 (Chittenden and Ashford, 1987).

Fan et.al. (2019) reported that the Adult male measure 2-5 mm and the female measure about 8-13 mm. The female is little under 1 mm in diameter and it's both ends are pointed (AL-Shadood, 2015). Males are characterized by single spicule which is about 100 μm to 141 μm with posterior ends strongly curved ventrally. The conspicuous caudal alae are supported by papillae. Females have the posterior end extended into a long slender point giving pinworms their name. The vulva opens between the first and seconds thirds of the body, and opens into the single vagina which leads to the paired uteri, oviducts, and ovaries (Roberts and Janovy, 2009; Paniker and Ghosh, 2013). Eggs have a thick shell and are convex on side and are flattened on the other (D-shape), they become infected within a few hours (50 – 60 μm) and the viability of egg 2-3 weeks (Taher, 2017).

Many studies reported that the pin worm infection lead to important changes in body weight

The aim of the current study is to determine the major effect of pinworm infection on blood parameters and determine the the interation of infection with child age.

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MATERIALS AND METHODS

The current study was conducted during the period 1/10/2023 to 1/3/2024 by using 40 children (20 males and 20 female) from patient where visited AL-Najaf AL-Ashraf province hospitals (AL-Sadr and AL-Zahraa). The child's age from 4 – 12 years and the infection diagnosis was detected by Scotland tape. Samples were collected 5 ml from vein by using disposable syringes to do hematological tests (Hb, WBC, RBC, T.P and PCV).

Hemoglobin meter with Drabkins solution was used to estimate Hb by solution of 1 gm of sodium bicarbonate and 0.05 of potassium cyanid and 0.2 potassium ferric cyanid in 1 liter of distilled water. Heamocytometer and turkes fluid to estimate the WBC. Micro-hematocrit method was used to estimate PCV.

Statistical analysis: Data were analyzed by SAS (2012) program and chi- square test was used to detect the significance differences among ages groups :

$$\chi^2 = \sum(O - E)^2 / E$$

where:

χ^2 : calculated chi- square value

O: Observed values

E: Expected values.

Completely randomized design (CRD) was used to determine the effect of pinworms infection on blood parameters under linear model:

$$Y_{ijk} = \mu + T_i + e_{ijk}$$

Where:

μ : overall mean

T_i : effect of infection on blood parameters

e_{ijk} : is the experimental error.

Least significant difference test was used to determine the significant difference among means.

RESULTS AND DISCUSSION

Results showed a significant difference ($P \leq 0.01$) among children were infected by pinworms according age (Table-1), the highest number was recorded in children with 5-10 years old while the less number was in children with more than 10 years old.

Table-1: Chi-square distribution among age group of children infected by pinworms

Age group	No.	%
Less than 5 years	15	36
5 – 10 years	25	64
χ^2	18.199**	

**($P \leq 0.01$)

The results of current study are agreeing with past studies which referred to the significant effect of age of child on infection rate, AL-Saqur (2016) and Merad et.al. (2018) mentioned that infection rate differ according the age stage and reported that the highest infection rate was recorded in children with 6 – 8 years old because the children in this age spend more time to play outside home and go to schools. From other side, the current study disagrees with a few past studies such Dudlova et.al. (2018) in Slovakia and Mahamoudv and et.al. (2020) in Iran who referred that the infection rate did not change significantly according to age.

Results showed a significant effect of pinworms infection on total protein content in blood (Table-2), the total protein differ significantly ($P \leq 0.05$) in infected children with less than five years old (6.89 g/dl) compared with control (7.45 g/dl).

Table-2: effect of pin worms infected on blood parameters in different stages of age.

Groups	Mean \pm SE				
	T.protein (g/dl)	Hb (g/dl)	PCV (%)	WBC (cell/mm ²)	RBC (106/mm ³)
<5 years old					
Infected	6.89\pm0.11 b	8.87\pm0.55 b	33.61\pm2.14 b	11.89\pm2.45 a	4.19\pm0.65
Control	7.45\pm0.15 a	10.91\pm0.94 a	39.12 \pm 2.10 a	6.94\pm1.03 b	4.87 \pm 0.89
Significance	*	**	**	**	N.S
5-10 years old					
Infected	7.27\pm0.08 b	8.51\pm0.8 b	32.54\pm 2.15 b	12.20\pm1.01 a	4.41\pm0.1
Control	7.78\pm0.09 a	11.27\pm0.93 a	40.19\pm 3.4 a	6.63\pm0.6 b	4.65\pm0.5
Significance	*	**	**	**	N.S

*($P\leq 0.05$), **($P\leq 0.01$), N.S : No significant

Total protein differed significantly in children blood who infected by pinworm compared with control in 5-10 years of old, the highest value was noticed in control (7.78 g/dl) while the lowest value was in infected group (7.27 g/dl). The total protein did not differ significantly between infected and control group in more than ten years of old.

Hemoglobin content differed significantly ($P\leq 0.01$) between infected and non-infected group; the blood content of hemoglobin was 10.91g/dl in control group compared with 8.87g/dl in infected group in children with less than five years of old. In children with 5-10 years of old, the hemoglobin content was 11.27 g/dl in control group while it was 8.51g/dl in infected group. Results showed that the hemoglobin content was 11.96g/dl in control group compared with 7.82g/dl in infected group.

Packed cells volume differed significantly ($P\leq 0.01$) between infected group and control for all ages that studied, the highest rate was recorded in control group namely, 39.12, 40.19 and 40.75% in the children that aged less than five, 5-10. White blood cells differed significantly ($P\leq 0.01$) between infected and non-infected groups and increased in the blood of infected children namely, 11.89, 12.20 and 12.77 **cell/mm²** in the three stages of old respectively compared with 6.94, 6.63 and 6.06 **cell/mm²** respectively. Results showed a slight difference in red blood cells between infected and control groups and no significant difference between the groups in both children with less than 5 years old and those with 5-10 years old.

The results of current study are agreeing with many past studies which referred to a significant effect of pinworms infection on blood parameters in different age stages such as Hama and Rahemo (2014) who mentioned that the infection by pinworms caused a significant decrease in packed cells volume and hemoglobin blood content compared with non-infected group under the same conditions and the same age. Obaiead et.al.(2020) who indicated that the hemoglobin content affected by pinworms infected in Iraqi villages while AL-Hasheme et.al (2020) reported that the pinworms infection lead to significant decrease in red blood cells.

Results showed that the body weight differed significantly by endoparasites infection (Fig.1) , the highest body weight rate was recorded in children with 4 and 6 years old (5%) while the less body weight loss rate was recorded in children with 9 years old

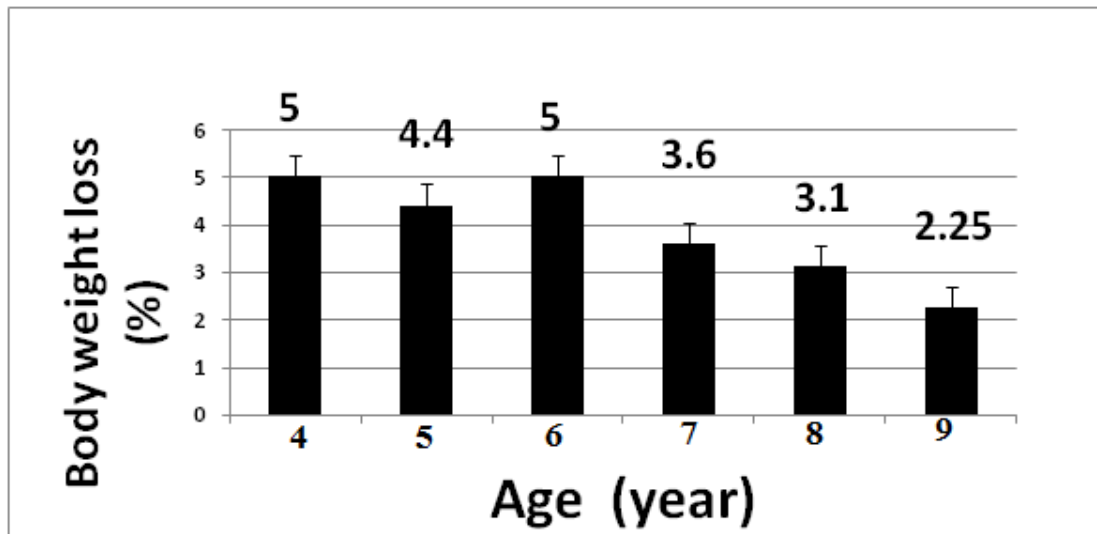


Fig 1: Body weight loss rate in male infected children by endoparasites.

In conclusion, the current results showed that the pinworms infected lead to important changes in blood parameters and these changes must be studied considerably to determine the physiological impact on children health, the body weight loss rate also affected by endoparasites infection and also this rate was differ from age to other.

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