

Distribution of intestinal protozoa and the effect of *Giardia lamblia* on anthropometric measurement in school children in kirkuk

Najlaa Kadhim Ali Zangana

Mosaa Mahmood Marbut, PhD, College of Medicine, Tikrit

Mohammed A. Kadir, PhD, College of Medicine, Kirkuk

Abstract

Aim: - The study was planned to show the distribution of protozoal intestinal parasites and the effect of *Giardia lamblia* infection on some physiological parameters of school age children in Kirkuk city, for the period from February 2002 till January 2003. **Subjects and Methods:** - the study was conducted on a six hundred and forty five pupils chosen randomly from six primary schools in Kirkuk city. The age of the pupils were ranging from 6-15 years old. The stool sample were collected from each child and examined by direct wet mount technique. The anthropometric parameters of pupils were assessed by estimation of body weight, height, and skin fold thickness. **Results:** - it was found that children infected with *Giardia lamblia* infection had lower body weight for age, height for age in both sexes than control group. The skin fold thickness among infected males and females was lower than control. The results of weight for age among infected group were subdivided into three groups according to growth chart, the first group involves those children below 3rd percentile 19.71% in males, and 16.90 % in females; the second group who were below $\leq 25^{\text{th}}$ percentile which presents the critical group and were 8.45% in males and 12.67% in females, and the third group above 25th percentile involved those children who have normal growth percentile were 21.12% in males and 19.71% in females. The height for age also divided in to three groups; the first groups were 16.90% in males, and 7.04 % in females, the second groups were 9.85% in both males and females; while in the third groups were 22.53 % in males, and 33.80 % in females. **Conclusion:** - It is concluded from this study that *Giardia lamblia* infected children had lower anthropometric parameters than controls.

Key words: Children, *Giardia lamblia* infected, Malnutrition

Introduction

Malnutrition is one of the causes of morbidity and mortality in childhood, Malnutrition may be due to improper and/or inadequate food intake or may

result from inadequate absorption of food (1).

Malnutrition is considered one of the most important factors that decrease body resistance to infections and health

hazards ⁽²⁾. When the nutrition deficit is severe and for long time the gain in weight and height will be retarded ⁽³⁾. Moreover, the children with poor growth will be at high risk of getting diseases and usually such diseases are of longer duration, more severe and more prone to complication ⁽⁴⁾. Disturbances in health and nutrition regardless of their etiology invariably may affect child growth ⁽⁵⁾.

Today's children who will determine tomorrow's future and the development of any country depend on health standard of population from children until the adult life. School children are a group of individuals at risk, in which good health for them is needed, this play an important role in the performance of the children on their future life. Assessing the nutritional status of group of children is an essential part of monitoring the community health in developing countries ⁽⁶⁾.

School age is regarded as the most important phase of childhood life during which the child enters the society's training system and emerges as a contributing member of the community. If the child does not have adequate health, the benefits of education will be lost because of lack of attention due to ill health ⁽⁷⁾.

At the age of 5 to 14 years, intestinal parasites have a major health problem because of their high prevalence rate and their wide distribution all over the

world and their relation with sanitation level and education of the community.

Intestinal parasitic infections mainly affect the physical and intellectual development of the children who are most vulnerable ⁽⁸⁾.

Regarding intestinal protozoa they are ranging in their effects on the human's host from being normal commensals as in the case of *Entamoeba coli* to frankly pathogenic to human being as in *Giardia lamblia* ⁽⁹⁾.

The present study was aimed to show the distribution of intestinal parasite and the effect of *Giardia lamblia* on some physiological parameters among the school age children.

Subjects and Methods

Study population the study was carried out on 645 school's children in Kirkuk city (315 males and 330 females), for the period from 1st March 2002 to 30th July 2004. The age of children was ranging between (6-15) years. The study was done on six primary schools from different regions of Kirkuk city, the children were chosen randomly.

Selection of infected and control groups:

Six hundred and forty five stool samples of children were examined, 274 were positive for different types of parasites, 129(47%) of them were positive

for *Giardia lamblia*. Among *Giardia* positive cases only 71 were chosen as positive and 71 children from negative cases were chosen as control to estimate anthropometric measurements

Collection of samples: -

Stool samples stool samples were collected from each child in clean containers labeled with name, date of collection, age, source and examined within (1/2 hours) by direct wet mount method using both normal saline and lugol's iodine solutions in Kirkuk general hospital laboratories.

Anthropometric measurements: -

The weights of children (infected and control) were measured by electronic balance distributed by (WHO/UNICEF to Primary hospital care) designed by Seca company and developed in Australia children were weighed with minimal clothing.

The height was measured by putting the child on standing position bare feet, fixed to the vertical rod of the scale with slight extension of head and the sliding 90-degree ruler on the summit of the head, which is neither forward nor backward. The weight and height of each infected and control groups were compared with growth chart from PHC.

The skin fold thickness was measured by caliper, which is designed by (Preston Company made in U.S.A) to

measure the fat in the subcutaneous area. The studied pupil were divided into three groups according to growth percentile:- groups I- $\leq 3\%$, groups II- $3\% < 25\%$, groups III- $> 25\%$.

Weight for age, height for age, and weight for height were measured for both infected and control groups ⁽¹⁰⁾.

Statistical analysis: -

Statistical analysis was done by using t-test to show the difference between each two groups (males and females, infected and control) for all parameters applied to show significant difference between them ⁽¹¹⁾.

Results

Parasitic examination: -

Table 1, indicates that out of six hundred and forty five faecal samples of children examined, it was found that two hundred and seventy four subjects were positive for different parasitic infection including *Giardia lamblia*, the number of children infected with *Giardia lamblia* were 129 (20%). Out of 129 *Giardia lamblia* positive cases, 60 (9.30 %) were males and 69 (10.69%) were females respectively. Out of 71 *Giardia lamblia* selected cases 35 (49%) were males and 36 (50 %) were females. In addition to *G. lamblia*, several parasites were detected studied group; *Entamoeba histolytica* in males and females were (2.63%, and

3.72%); *H. nana* among males subjects was (2.32%) and among females was (0.93%); the rate of mixed infection with *Giardia lamblia* and *Hymenoleps nana* among males was (4.34%), while among females was (2.17%); the rate of mixed infection *Giardia lamblia* and *Entamoeba histolytica* among males was (1.55%) and (2.53%) among females and *Enterobius vermicularis* was (0.77%) among males and (1.39%) among females.

Weight for age and Height for age measurements: -

The results of weight for age according to the growth chart from seventy one infected showed that the weight of children in males and females those below 3rd percentile were 8.45% , 7.04%; and those laid between 3rd and 10th percentile in both males and females were 5.63% and 7.04 %; there were 4.22 % and 8.45 % of children laid between 10th and 25th percentile, while 8.45 % and 7.04 % to drop between 25th and 50th percentile , and the rate of those laid between 50th and 75th percentile were 2.81 % and 4.22 % (table 2).

Table (3) indicate that the rates of height for age in males and females were 8.45 % and 4.22 % of children laid below 3rd percentile, and 5.63 %, 1.40% in both males and females to fall

between 3rd and 10th percentile. While the rate of those laid between 10th and 25th percentile were 4.22 % in both males and females, and 8.45 % of children to drop between 25th and 50th percentile also has the same rate in females, and 7.04 % , 5.63 % laid between 50th and 75th percentile in both sexes. While the rate of females children to fall between 75th and 90th percentile were 5.63%.

Table (4) shows the comparison of the mean and S.D of weight for age (W for A), in both male and female children. It was found that there was significant difference ($P < 0.05$) in weight between infected and control groups in both sexes, its value in infected groups was lower than control ones.

Table (5) shows the comparison of mean and S.D of the height for age (H for A), in both males and females. There was significant difference ($P < 0.05$) among infected and control groups in both sexes, its value in infected groups was lower than control ones.

Table (6) shows the comparison of the mean and S.D of weight for height (W for H), in both males and females. There was significant difference ($P < 0.05$) among infected and control

groups in both sexes, its value in infected groups was lower than control ones.

Skin fold thickness(mm): -

Table (7) shows comparison of Mean and SD of skin fold thickness among infected and control groups, males and females children.

There was significant difference ($P < 0.05$) among infected and control groups in both sexes; their values among infected groups were lower than control ones.

Discussion

Today nutritional deficiencies and parasitic infections constitute major public health problems in Iraq and other countries of the developing countries. Therefore the aim of the current study is to assess the nutrition status among children who are infected with intestinal protozoa by anthropometric measurement. *Giardia lamblia* is one of the main causes of malnutrition and malabsorption which affected all age groups of this study from 6-15 years.

Parasite:-

It seems from the results of the current study that the parasitic infection was common among school children (22.32%); the highest rate of infection was *Giardia lamblia* (20%). This is in

agreement with a study done by Kadir and Mohammad-Ali⁽¹²⁾, who found the rate of *Giardia lamblia* among school age children 17.93% in Kalar town. In Turkey, Celiksoz, et al found among 1730 school children 599 (34.6%) were parasitic, 192 (11.1%) had only *G. intestinalis*⁽¹³⁾. Al-Hwaidi,⁽¹⁴⁾ who showed that the high rates 26.51% among the population of Shatrah. The high rate of *G. lamblia* reflects the unawareness of children to health status, and also the low educational status of their parent's which makes them unable to teach their kids about hygienic rules, as well as the low socioeconomic status due to poor water supply. In addition to that there were other parasitic infections which were detected in the studied group e.g. *E. histolytica* (0.93%), *H. nana* (0.46%), mixed infection of *G. lamblia* and *H. nana*, and *G. lamblia* and *E. histolytica*, *Entrobious vermicularis*. The prevalence of infection with one or more parasites among children found in this study was lower than that reported in Nepal⁽¹⁵⁾, (66.6%) while higher than that reported in Ethiopia⁽¹⁶⁾, (10.3%) and in developing countries 15-20%⁽¹⁷⁾, in the united states, the rate of gut parasite varied from 4-42%⁽¹⁸⁾.

Anthropometric measurement:

The rate of weight for age among infected children from seventy one and according to growth chart can be divided to three groups, the first group who failed to thrive below $\leq 10^{\text{th}}$ percentile which involve those below 3^{rd} percentile and their percentage were 19.71% in males, and the same rate in females 16.90% who also failed to thrive. The second group who were below $\leq 25^{\text{th}}$ percentile who are in critical stage was 8.45% in males while in females was 12.67% who are getting to lose their weight, and third group above 25th percentile involve those who have normal growth percentile and their percentage was 21.12% in males and 19.71% in females.

The result of height for age also divided to three groups the first group below $< 10^{\text{th}}$ percentile who failed to thrive it involves those below 3^{rd} percentile their percentage were in males 16.90%, and in females 7.04%, while in second group who were below $\leq 25^{\text{th}}$ percentile who were in critical stage was 9.85% in males and the same rate in females was 9.85%. Also third group above 25th percentile involves those who have normal growth percentile and their percentage was 22.53% in males and in females 33.80%. This means they have undernutrition and mild stunting and the males appeared more affected than females in height for age.

This is in agreement with a study done by Newman et al.⁽¹⁹⁾; they reported that children with symptomatic infections had significantly lower weight for age and height for age than asymptomatic children in Brazil. Also in a study done by Celiksoz, et al.⁽¹³⁾, who reported that the weight and height were lower in the children with giardiasis than the children without infection in school children in Turkey. In Iran, Nematin, et al.⁽²⁰⁾, reported that *G. lamblia* was significantly associated with low height for age (stunting) and low weight for height (wasting), in school children in Tehran.

In table (4, 5) the lower weight for age and height for age among infected children than control ones; it is found that mean and SD of weight of age among infected male children for the age 6, 7, 8, 9 years were lower than control groups, but were heavier than infected female children, while for the 10, 11, 12, 13-15 years were lower than control groups, but were lower than infected female. The mean and S.D of the height in infected males for the age 6, 7, 8, 9, 10, 11, 12, 13-15 years were lower than control groups, and for the age 6, and 12 years they were lower in infected males than infected females. This may be due to inadequate nutritional intakes in those ages; while in the (table 6) and according to weight for height in infected females the 7, 8, 10, 11 years lies between 10-25th

percentile and 6, 12, 13 years at 25-50th percentile, and at age 9 years < 90. While in male 6, 7, 11, 13 years at 25-50th percentile, 8 years at 50-75th percentile, and 10 years on 25th percentile and 12 years at 3rd percentile. This may be due to genetic predisposition, or may be due to the change in stage of adolescence life which leads to abnormality of the weight for height.

The results of this study disagree with a study done by Ish-Horowicz et.al⁽²¹⁾, who found that *Giardia lamblia* infection was identified in 33 children at age 3 years; and the infection was asymptomatic and usually associated with prolonged carriage of the parasite, but there were no significant difference in weight and height for age between *Giardia lamblia* positive children and *Giardia lamblia* negative children and they tended to achieve higher weight and height for age above the 50th percentile this may be the age group is below school age.

The children have infection and low weight for age and height for age, and this may be due to the deficient in nutrition intake or genetic defects, and also it depends on endemic of parasite and on geographical area.

In the present study the mean and SD of skin fold thickness in both male and female infected children with *Giardia lamblia* was lower than control ones, this

findings is in agreement with the study done by AL-Naki in 1995⁽²²⁾ in Tuzi city who found that the skin fold thickness in infected male children was significantly lower than control groups, while in female children was not. This indicates that skin fold thickness is the first index which is affected in malnutrition and may be taken as first parameter for recognition of early malnutrition. This reflects that *Giardia lamblia* infection leads to protein calorie malnutrition, which is also, reported by others investigators Behram et.al⁽¹⁾.

It is concluded in this study that *Giardia lamblia* infected group had lower weight for age, height for age, and weight for height decrease for the age group 12 years in males children lower than 3rd percentile. The skin fold thickness was decreased in both males and females infected with *Giardia lamblia*.

It is recommended to detect parasitic infection and malnutrition or malabsorption among school children, in order to improve the nutritional status of children.

References

- 1- Behrman, RE, Kliegman, RM, Jenson, HB, editors: Nelson textbook of pediatrics, ed.16th, Philadelphia, WB Saunders, 2004 p, 138-139,140.

- 2-WHO, Seventh Genral programs of work convering the period 1984- 1989. Health for all series, WHO Geneva 1982. No.8
- 3-Pipes P. L. and Trahms C. M. Collecting and assessing food intake information in; nutrition in infancy and childhood. 5th edition, Mosby Yearbook, Boston, 1993; PP 22- 24,45, 56-60.
- 4-Harfouche. The state of children health in the Eastern Mediterranean region. EMRO technical Publication. WHO/Regional office of the Eastern Mediterranean. Alexandria, Egypt. 1995. Series 9.
- 5-WHO/ UNICEF. Rep. On overview from the WHO Global Data base Child Growth. April .1993.
- 6-AL- Janabi M. H. Common health problems among primary school children in Sinnyia district, A diploma Dissertation in PHC College of Medicine, Tikrit University, 1999.
- 7-Parveen, R. AL-Yousif N, AL-Dabal B. Nutritional profile of Saudi primary school girls in an urban region, Ann. of Saudi Med., 1989; 9 (4): 371-77.
- 8-Higgins, D. A. Jenkins, D. J., Sundari Juwono, S. Human Intestinal parasitism in three Indonesian areas. A survey. Ann. Trop. Med. and parasito., 1984; 78(6), 637-648.
- 9-WHO, Scientific Group Report. Intestinal protozoal and helminthic infections. 1981, No.666.
- 10-Steller, Ayebono HC, Brink A, E.W. et. al. Nutritional status of preschool children in Togo, Bulletin of the WHO, 1980; 58 (6): 875-889.
- 11-Essex-soril D., 1995. Medical Biostatistics, Appleton and Lange USA: 140, 247.
- 12-Kadir, M.A. and Mohammad-Ali,S.M. prevelance of *Giardia lamblia* in infected children in Kalar town with some haematological and biochemical parameters. J. Duhok Univ., 2012, 15(1), 56-62.
- 13- Celiksoz, A; Acioz,M; Degerli, S; Cinar, Z, and Erandac, M.(2005) Effect of giardiasis on school children success, weight and height indices of primary school children in Turkey. *Pediatr Int.*, 2005, 47(5), 567-71.
- 14- Al-Hwaidi, JR. Prevalence of intestinal parasites among population of Shatrah. *Tech. Res. J.* 2000; 63:9-15.
- 15- Sharma, BK., Rai, SK., Rai, DR., Choudhury, DR. Prevalence of intestinal parasitic infestation in school children in the northeastern part of Kathmandu Valley. Nepal. *Southeast Asian J. trop. Med. Public Health.* 2004; 35: 5-501. (Internet)
- 16- Asfaw, ST., Goitom, L. Malnutrition and enteric parasitosis among children in Aynalem. *Ethiopia.*, 2000; 14: 67-75. (Internet)

17- Kuck, C. J. Common intestinal parasites. Am. Family. Phys. J. 2004; 69: 8- 1181. (Internet)

18- Wittner, M., Tanowitz, HB. Intestinal parasites in returned travelers. Med. Clin. North. Am. 1992, 79: 48- 1433. (Internet)

19- Newman, RD., Moore, SR., Lima, AA., Nataro, JP., Guerrant, RL., Sears, CL. A longitudinal study of *Giardia lamblia* infection in northeast. Brazilian children. Trop. Med. Int. health. 2001; 6: 34-624.

20- Nematn, J.; Gholamrezanezhad, A. and Nematn, E. Giardiasis and other intestinal parasitic infections in relation to anthropometric indicator of malnutrition: a

large population –based survey of school children in Tehran. Ann. Trop. Med. Parasitol., 2008, 102(3), 209-14

21- Ish-Horowicz, M., Korman, SH., Shapiro, M., Har-Even, U., Tamir, I. Asymptomatic giardiasis in children. Pediatr. Infect. Dis. J. 1989; 8:9-773. (Internet)

22- Naki, H.Z. Intestinal amoebiasis among primary school children. Tooz city. A diploma Dissertation in PHC, College of Medicine, Tikrit University, 1995.

Table (1): The distribution of parasitic infections among (645) school children

| PARASITE | Total No.+ ve | Positive cases | | | | Negative cases | | | |
|-----------------------|---------------------|----------------|--------|--------------|--------|----------------|--------|---------------|--------|
| | | No. positive | | Positive (%) | | No. -ve | | Positive (%) | |
| | | Male | Female | Male | female | Male | Female | Male | Female |
| <i>G. lamblia</i> | 129 | 60 | 69 | 9.30% | 10.7% | 175 | 196 | 27.1% | 30.39% |
| <i>E. histolytica</i> | 41 | 17 | 24 | 2.63% | 3.72% | | | | |
| <i>H. nana</i> | 21 | 15 | 6 | 2.32% | 0.93% | | | | |

| | | | | | | | | | |
|--------------------------|------------|------------|------------|--------------|-------|------------|--|--|--|
| <i>Mixed G. + H.</i> | 42 | 28 | 14 | 4.34% | 2.17% | | | | |
| <i>G. + E.</i> | 27 | 10 | 17 | 1.55% | 2.53% | | | | |
| <i>E. vermicularis</i> | 14 | 5 | 9 | 0.77% | 1.39% | | | | |
| Total | 274 | 135 | 139 | 42.5% | | 371 | | | |

Table (2): The weight for age of children according to the growth percentile

| Percentile | >3 rd | 3-10 th | 10-25 th | 25-50 th | 50-75 th |
|----------------|------------------|--------------------|---------------------|---------------------|---------------------|
| Males | 8.45% | 5.63% | 4.22% | 8.45% | 2.81% |
| Females | 7.04% | 7.04% | 8.45% | 7.04% | 4.22% |

Table (3): The height for age of children according to the growth percentile

| Percentile | >3 rd | 3-10 th | 10-25 th | 25-50 th | 50-75 th | 75-90 th |
|----------------|------------------|--------------------|---------------------|---------------------|---------------------|---------------------|
| Males | 8.45% | 5.63% | 4.22% | 8.45% | 7.04% | 0 |
| Females | 4.22% | 1.40% | 4.22% | 8.45% | 5.63% | 5.63% |

Table (4):The weight of infected and control male and female children at different age group (Weight for age)

| According age group Years)(| Mean ± SD | | | |
|--------------------------------|---------------------------|-----------------------------|---------------------------|-----------------------------|
| | Females | | Males | |
| | Group 1 Control N= 41 | Group 2 Infected N=36 | Group 3 Control N=30 | Group 4 Infected N=35 |
| 6-6.99 | 22.95 ±0.49 (2) | 18.57 ±2.44 (7) * | 24.75 ±1.89 (4) | 19.75 ±0.50 (4) * |
| 7-7.99 | 26.2 ±2.83 (3) | 20.5 ±0.71 (2) * | 25.5 ±2.12 (2) | 21.14 ±2.54 (7) * |

| | | | | |
|---------------|--------------------------------|------------------------------------|----------------------------------|-----------------------------------|
| 8-8.99 | 28.5 ±0.7 (3) | 22.67 ±1.46 (7) * | 26.50 ±0.71 (2) | 23.5 ±0.71 (2) * |
| | Mean ± SD | | | |

| | | | | |
|-----------------|-----------------------------------|------------------------------------|-----------------------------------|------------------------------------|
| 9-9.99 | 28.62 ±2.26 (8) | 24.22 ±2.28 (9) * | 25.25 ±0.35 (2) | 25 ±3.37 (4) NS |
| 10-10.99 | 31.25 ±3.30 (4) | ۳۰ ±4.24 (2) * | 29 ±4.24 (2) | 25.38 ±2.00 (8) * |
| 11-11.99 | 35.58 ±3.06 (12) | 30.4 ±5.68 (5) * | 31.33 ±1.53 (3) | 29.25 ±4.99 (4) * |
| 12-12.99 | 36.4 ±3.65 (5) | 29 ±4.24 (2) * | 35 ±3.00 (3) | 28.50 ±0.71 (2) * |
| ≤ 13-15 | 45.76 ±3.51 (4) | 35 ±7.07 (2) * | 42.33 ±5.91 (12) | 34 ±4.24 (4) * |

t-test *P< 0.05= significant NS= not significant

Table (5): The height of infected and control male and female children at different age group (Height for age)

Distribution of intestinal protozoa and the effect of Giardia lamblia on anthropometric measurement in school children in kirkuk

| <i>group</i> (Years) | Females | | Males | |
|-------------------------|-------------------------|--------------------------|-------------------------|--------------------------|
| | Group 1 Control N=41 | Group 2 Infected N=36 | Group 3 Control N=30 | Group 4 Infected N=35 |
| ٦-6.99 | ١١٤.٥ ±0.71 (2) | ١١١.٧١ ± 4.68 (7) * | ١٢٢.٠٠ ±٢.١٦ (4) | ١١٣.٢٥ ±٢.٧٥(4) * |
| ٧-7.99 | ١٢٢.٥ ±0.71 (3) | ١٢٠.٥ ±2.12 (2) * | ١٢٣.٥ ±0.71 (2) | ١١٧.٨٥ ±4.78 (7) * |
| ٨-8.99 | ١٢٦.٠٠ ±4.24 (3) | ١٢٥.٣٣ ±3.27 (7) NS | ١٢٣.٥ ±0.73 (2) | ١٢١.٥ ±0.71 (2) * |
| ٩-9.99 | ١٣٠.٧ ±2.31 (8) | ١٢٩.٥٦ ±2.13 (9) * | ١٢٩.٠٠ ±6.06 (4) | ١٢٢.٠٠ ±1.41 (2) * |
| ١٠-10.99 | ١٣٩.٠٠ ±1.15 (4) | ١٣٧.٠٠ ±2.83 (2) * | ١٤٠.٥ ±0.71 (2) | ١٣٠.٨٧ ±3.56 (8) * |
| ١١-11.99 | ١٤٢.٧٥ ±2.99 (12) | ١٤٠.٤ ±5.98 (5) * | ١٤٠.٠٠ ±1.0 (3) | ١٣٦.٧٥ ±6.24 (4) * |
| ١٢-١2.99 | ١٤٦.٨ ±3.70 (5) | ١٣٧.٥ ±0.71 (2) * | ١٤٦.٦٧ ±3.79 (3) | ١٤٠.٠٠ ±5.66 (2) * |
| ≤ 13-15 | ١٥٣.٥ ±2.08 (4) | ١٤٦.٠٠ ±9.90 (2) * | ١٥٦.٧٣ ±7.39 (12) | ١٤٢.٥ ±6.95 (4) * |

t-test * P< 0.05= significant NS= not significant

Table (6): The weight and height of infected and control male and female children at different age group (Weight for height)

| Weight | | | Height | | |
|-----------------------------|--------------------|----------------------|---------------------|---------------------|------------------------|
| According age group (years) | Mean ± SD | | According age group | Mean ± SD | |
| | Males=35 | Females=36 | | Males=35 | Females=36 |
| | infected | | | infected | |
| 6-6.99 | 19.75 ±0.50 (4) | 18.57 ±2.44 (7) * | 6-6.99 years | 113.25 ±2.75 (4) | 111.71 ± 4.68 (7) * |
| 7-7.99 | 21.14 ±2.54 (7) | 20.5 ±0.71 (2) * | 7-7.99 years | 117.85 ±4.78 (7) | 120.5 ±2.12 (2) * |
| 8-8.99 | 23.5 ±0.71 (2) | 22.67 ±1.46 (7) * | 8-8.99 years | 121.5 ±0.71 (2) | 125.33 ±3.27 (7) * |
| 9-9.99 | 25.00 ±3.37 (4) | 24.22 ±2.28 (9) * | 9-9.99 years | 122.00 ±1.41 (4) | 129.56 ±2.13 (9) * |
| 10-10.99 | 25.38 ±2.00 (8) | 24.22 ±4.24 (2) * | 10-10.99 years | 130.87 ±3.56 (8) | 137.00 ±2.83 (2) * |
| 11-11.99 | 29.25 ±4.99 (4) | 30.4 ±5.68 (5) * | 11-11.99 years | 136.75 ±6.24 (4) | 140.4 ±5.98 (5) * |
| 12-12.99 | 28.50 ±0.71 (2) | 29 ±4.24 (2) * | 12-12.99 years | 140.00 ±5.66 (2) | 137.5 ±0.71 (2) * |
| ≤ 13-15 | 34.00 ±4.24 (4) | 35.00 ±7.07 (2) * | ≤13-15 years | 142.5 ±6.95 (4) | 146.00 ±9.90 (2) * |

t-test * $P < 0.05$ = significant NS= not significant ()= Number

Table (7): Comparison of skin fold thickness, between male and female children

| Parameters | Mean \pm SD | | | |
|--------------------------|-----------------------|--------------------------|-----------------------|---------------------------|
| | Male n=65 | | Female n=77 | |
| | Group 1 Control N=30 | Group 2 Infected N=35 | Group 3 Control N=41 | Group 4 Infected N=36 |
| Skin fold thickness / mm | 9.17 \pm 2.79 | 8.4 \pm 2.14 (*) | 9.01 \pm 2.80 | 8.20 \pm 2.32 (*) |

t-test (*) $P < 0.05$ = significant N= number

انتشار الالوي المعوية وتأثير الإصابة بالجيارديا اللمبليا على بعض المعايير الفسلجية لدى اطفال المدارس الابتدائية في مدينة كركوك.

نجلاء كاظم علي زه نكنه ماجستير فسلجة ، كلية الطب، كركوك/

ا.د. موسى محمود مرتبط استاذ، كلية الطب، تكريت

ا.د. محمد عبد العزيز قادر استاذ، كلية الطب، كركوك

الخلاصة:-

هدفت الدراسة الحالية إلى انتشار الالوي المعوية وتأثير الإصابة بالجيارديا اللمبليا على بعض المعايير الفسلجية لدى أطفال المدارس الابتدائية في مدينة كركوك.

الأشخاص وطرائق العمل:- حيث أجريت الدراسة على ستمائة وخمس وأربعون طفلاً تم اختيارهم بصورة عشوائية من ست مدارس للابتدائية إذ تراوحت أعمار الأطفال الذي أجريت عليهم الاختبارات بين ٦-١٥ سنة، ولمدة ما بين شهر شباط ٢٠٠٢ ولغاية كانون الثاني ٢٠٠٣. تم جمع عينات البراز من كل طفل وتم فحصه بطريقة الفحص المباشر، وقد اعتمدت المعلومات التي أخذت عن الحالة التغذوية من حيث وزن الجسم بالنسبة للعمر، والطول بالنسبة للعمر، وسمك طية الجلد. النتائج:- أن الأطفال الذين عانوا من الإصابة بالجيارديا اللمبليا لديهم نقص في الوزن والطول قياساً بأعمارهم ومن كلا الجنسين بالمقارنة مع مجموعة السيطرة، أما من ناحية سمك طية الجلد فقد كانت النتائج عند الذكور والإناث المصابين بالجيارديا اللمبليا كانت أقل بالمقارنة إلى المجموعة السيطرة.

وبالنظر لمخطط النمو يمكن تقسيمهم من ناحية الوزن قياساً بالعمر إلى ثلاث مجاميع: المجموعة الأولى تتمثل بمن هم دون المستوى العاشر ومن ضمنها من هم دون المستوى الثالث التي تتمثل فيهم نقص الوزن بنسبة ١٩.٧١% عند الذكور بينما كانت ١٦.٩٠% في الإناث، المجموعة الثانية تتمثل بمن هم دون المستوى الخامس والعشرين والتي تمثل المرحلة الحرجة وكانت النسبة عند الذكور ٨.٤٥% في حين الإناث كانت نسبتهم ١٢.٦٧%، أما المجموعة الثالثة تتمثل بمن هم فوق المستوى الخامس والعشرين والتي هي ضمن المستويات الطبيعية لمخطط النمو إذ بلغت نسبة الذكور فيها ٢١.١٢% في حين كانت نسبة الإناث ١٩.٧١%، كما ويكون توزيع حالات الأطفال من ناحية الطول قياساً بالعمر إلى ثلاث مجاميع أيضاً: المجموعة الأولى حيث كانت نسبتها ١٦.٩٠% عند الذكور بينما كانت ٧.٠٤% في الإناث، المجموعة الثانية كانت نسبتها ٩.٨٥% عند الذكور والإناث، المجموعة الثالثة إذ بلغت نسبة الذكور فيها ٢٢.٥٣% في حين كانت نسبتها ٣.٨٠% عند الإناث.

أستنتج من هذه الدراسة بأن الأطفال المصابين بالجيارديا المعوية لديهم قيم أقل في الحالة التغذوية (أي المعايير البدنية)، عن المجموعة السيطرة.