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Research article

Prevalence of intestinal pathogens among women and children

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ABSTRACT

In developed countries, intestinal infections appear to be a significant public health issue. Indigenous peoples are especially vulnerable due to socioeconomic, ecological, environmental, and cultural factors. The prevalence of STH diseases, anemia, and malnutrition among women and children in the Mosul City - Ninevah province was investigated, taking into account demographic and socioeconomic factors. In the present work, 261 patients who revised governmental healthcare centre/North Nineveh were chosen to apply the study in the period between September/2019 and January/2020. Reviser's age was ranged from 1-40 years. They all diagnosed have intestinal parasites. Hemoglobin concentration and RBC count were estimated for each patient.The Prevalence of intestinal parasite was: 34.2% for Entamoeba histolytica, 28.7% for Giardia lamblia, 13.4% for Ancylostomiasis duodenale, 10.3% for Trichuris Trichur, 7.7% for Ascaris lumbricoides, and 5.7% for Hymnologies nana. Intestinal parasites were most common in the 11-20 age group (infection percentage 34.1%), in which parasitic infections were distributed as 13.4% for Entamoeba histolytica, 7.3% for Giardia lamblia, 5.4% for Ancylostoma duodenale, 3.8% for Trichuris trichura, 2.7% for Ascaris lumbricoides and 1.5% for Hymnologies nana. Poverty alleviation is critical; some of the major problems affecting the population in rural areas, such as being left out of the mainstream are also It is necessary that regular de-worming, nutrition, better nutrition, sanitation, and personal hygiene are included in the program for these kids as part of the overall well-being of the entire communities.

Keywords: Prevalence, Anemia, Intestinal, Pathogens, Population.

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INTRODUCTION

Anemia is a serious global health issue affecting young children and pregnant women. that 42% of the under-year-old and 40% of the pregnant women in the world are anemic[1]. The World Health Organization (WHO) estimates that more than two billion people, or 24.8 % of the world's population, are affected by iron deficiency and anemia[2]. Anemia's etiology is multifactorial and is a contributing factor that includes numerous conditions, including nutritional deficiencies, chronic infections, and inherent blood disorders[3]. Iron deficiency (ID) is the most common nutritional deficiency worldwide, with infants and young children being particularly vulnerable.[4]. Regular menstrual losses, as well as the increased iron demands of pregnancy and lactation, placed women of childbearing potential at the most significant risk of ID[4]. Anemia affects 30.2 % of women of childbearing age, and it is widespread in Africa (47.5 %) and Southeast Asia (35.7 %)[5]. Several serological and biochemical tests, including ferritin, serum iron, transferrin saturation (TSAT), and total iron-binding ability, can be used to confirm an IDA diagnosis (TIBC). However, many physiological and pathological states, such as inflammations, infections, dietary intake, and circadian rhythm, may influence these iron parameters, reducing their diagnostic utility. The quality of reticulocyte hemoglobin (CHr) has recently emerged as a more accurate predictor of iron stores and bioavailability [6-8]. The prevalence of STH diseases, anemia, and malnutrition among women and children in the Northen-east of Mosul City - Ninevah province was investigated, taking into account demographic and socioeconomic factors.

METHODS

A cross-sectional study was conducted in the city of Mosul for the period from December 1 to April 1, 2020. The ethical approvals for the research were obtained from the Medical Research Ethics Committee at the Nineveh Health Department. The Primary Health Care Center, City of Mosul, took place for sample collection. An information sheet was prepared to gather the data that related to the subject's socio-demographic characteristics such as (age, gender, socioeconomic status), as well as the signs and symptoms of anemia. Two hundred and sixty-one patients participated in the present study. The stool sample was put in specific containers, in which 10 ml of 10% formalin was added for fixation and preservation. Collected

samples were put in the refrigerator (10◦C) for 24-48hrs till subsequent examination. Stool samples were examined macroscopically and microscopically for intestinal parasites; parasitic stages (egg, helminths, and protozoan) were categorized according to the descriptive methods depending on the direct wet mount's preparation method and sedimentation concentration technique. Three preparation were tried with each sample. Entire preparation should be examined. The concentration of blood hemoglobin was estimated for each patient using the Sahli method. Data were coded in entering in the statistical package for social sciences software (25).

RESULTS

The Prevalence of intestinal parasite was: 34.2% for Entamoeba histolytica, 28.7% for Giardia lamblia, 13.4% for Ancylostomiasis duodenale, 10.3% for Trichuris Trichur, 7.7% for Ascaris lumbricoides, and 5.7% for Hymenolepis nana. Intestinal parasites were most common in the 11-20 age group (infection percentage 34.1%), in which parasitic infections were distributed as 13.4% for Entamoeba histolytica, 7.3% for Giardia lamblia, 5.4% for Ancylostoma dudenale, 3.8% for Trichuris trichura, 2.7% for Ascaris lumbricoides and 1.5% for Hymenolepis nana. On the other hands, Intestinal parasites were less Prevalence in the 31-40 age group, with infection distribution: 6.5% for E. histolytica, 4.7% for G. lamblia, 0% for A. duodenale, 1.9% for T. trichura, 1.5% for A. lumbricoides and 0% for H. nana. Generally, 36.45% of the parasitized patients (95 of 261) were detected to have a moderate diminish in hemoglobin concentration (9.6 g/dl) and RBC count (3.44 ×1012). Hemoglobin concentration and RBC count were varying according to parasite species. The lowest hemoglobin concentration was recorded in patients with E. histolytica (8.4 g/dl). The lowest RBC count was found in patients with A. duodenale (2.9×1012)

Table 1: Distribution of study subject according to Types of parasitic infections

Parasite species	NO	%
Entamoeba histolytica	89	34.2
Giardia lamblia	75	28.7
Ancylostomadudenale	35	13.4
Trichuristrichura	27	10.3
Ascaris lumbricoides	20	7.7
Hymenolepis nana	15	5.7
Total	261	100

Table 2: Distribution of intestinal parasitic infections according to age groups

Parasite species	Age groups								Total
	1-10		11-20		21-30		31-40		
Entamoeba histolytica	15	5.7%	35	13.4%	22	8.5%	17	6.5%	89 (34.2%)
Giardia lamblia	27	10.4%	19	7.3%	17	6.5%	12	4.7%	75 (28.7%)
Ancylostoma dudenale	16	6.2%	14	5.4%	5	1.9%	0	0%	35 (13.4%)
Trichuris trichura	8	3.1%	10	3.8%	4	1.5%	5	1.9%	27 (10.3%)
Ascaris lumbricoides	9	3.4%	7	2.7%	0	0%	4	1.5%	20 (7.7%)
Hymenolepis nana	9	3.4%	4	1.5%	2	0.8%	0	0%	15 (5.7%)
Total	84	32.2%	89	34.1%	50	19.2%	38	14.6%	261 (100%)

Table 3: Occurrence of anemia according to species of the invading intestinal parasite

Parasite species	NO of anemic/parasitic	%
Entamoeba histolytica	35 of 89	39.3
Giardia lamblia	23 of 75	30.7
Ancylostoma dudenale	17 of 35	48.6
Trichuris trichura	10 of 27	37.0
Ascaris lumbricoides	7 of 20	35.0
Hymenolepis nana	3 of 15	20.0
Total: 95 of 261 Average: 36.4%		

DISCUSSION

Anemia in several developing countries, especially in rural communities, is considered a medical condition that merits continuous public health intervention and continues to be a significant problem in public health. In developing and developed countries, iron deficiency has been estimated to be 40.0% of many children and pregnant wives[9-11]. The present study found that the general Prevalence of anemia among rural and remote children in Nether east City of Mosul was 28.8%, 46% had ID. The results showed that anemia and IDA were relatively higher among rural children in comparison to data from other countries. The Prevalence of anemia, ID, and IDA in South East Brazil was 11.8%, 12.7%, and 4.3%, respectively, of highly endemic crooked infection .[12]. Similarly, 31.0 % of children in northeastern Thailand were found to be anemic.[13]. However, the findings of this study are similar to an analysis of Nigerian children done last year, which showed that, according to anemia, 38.6% of them were anemic. [14]. Anemia in Kenya, on the other hand, was extremely high (92.0 %) due to the study area's high Prevalence.[15].During the research, 261 revisers to Telkeif governmental healthcare center were found to have intestinal parasites. Six species of intestinal parasites were identified based on microscopic and macroscopic examinations, two of which are protozoans (Entamoeba histolytica and Giardia lamblia), three of which are nematodes (Ancylostoma duodenale, Trichuris trichura, and Ascaris lumbricoides), and one of which is tapeworms (Hymenolipis nana).The dominant intestinal parasite was Entamoebacidia with 89 cases (34.2 %), Ancylostoma duodermella duodenitum was at the second with 75 (28.7 %), and Trichuris basilaris in 13 (10.3). (5.7 % of the whole parasitic infections). The Prevalence of Entamoebatrium and Giardia may be related to the fact that the direct life cycle is more common, and mechanical animal waste disposal in rural areas contributes to this. The whipworm (Trichuris trichralis) and the Roundworm (Ascaris lumbricoides)

levels of infection were, on the other hand, lower than previously diagnosed parasitic infestations. Infestation is most important, given that their more simplified life cycles do not exist[16].Secondly, they are more inclined to use inorganic fertilizer with additional urbanization than they were before in that area, resulting in a shortage of night soil. Think about all the things that can influence the infection %age. With respect to the intestinal tapewanosomes research, hymenopylergymnosin seems to have a lower infection rate, this may explain the fake zero infection diagnosis[17, 18] .This table is based on the average of a study that determined the percentage of intestinal parasites of each age group studied (from 1-40 years old). Celiac disease incidence was higher in 11-to-to-to-20-year-olds (34.1% of the entire group). while participants in the 31-40 group had the lowest infection rate (14.6 %). the age group 1 to 10 years had the highest Prevalence of the tapeworm, Ancylostoma duodenea lumbricoides, and Hymenolepis nana (each 3.4 %). These %ages of amoebiasis infection rose from eleven to twenty-two, with Entamoeba histolytica (13.4%) and Trichuris (3.8%), while the total number rose from twelve to twenty. This deviates from Airoong, et al(2017) .'s findings[19], which found that the highest level of parasite infection was found in preschoolers and primary school students. Members of the age group 21 to 30 had the lowest Trichuris disease (1.5%) and Ascaris lumbricum contagium (0%) infection but saw the greatest increase in Prevalence of Entamoeba histolytica (6.5%) and Ancylostoma pulmine (30% increases) infection.

The Prevalence of anemia, ID, and IDA among young children was higher than school children among the age groups. However, the benefit of schoolchildren with access to government-sponsored iron supplementation in rural schools can be attributed to this finding. The present study found that the IDA in children receiving iron supplements during the previous 12 months was low, although not statistically significant. Research has examined the relationship between school-based iron nutrition and folate administration and demonstrated that it has a beneficial effect on these children's iron status. [20]. It was also demonstrated that the method for improving school children's well-being was practical, safe, effective, and cost-effective[20].Also, in comparison with children in the school, the number of six-year-olds was small. Therefore, we were unable to investigate the correlation between IDA and cases of anemia. Nevertheless, earlier studies show anemia declines at age twenty-one in Malaysia[21]. Participants' low iron intake is a factor in the high Prevalence of anemia and IDA in this study. Although these efforts were for naught, however, researchers found that the recommended daily iron intake was way below the level recommended for anemia-risk children. This study found that at least one of the species showed a high incidence of STH infection in at 76.5% among the children. In 40.5% and 69% of the specimens, respectively (13.5 %). Similar studies found a prevalence of trichinellosis (range: 26 to 98%), filarial infections (range: 19 to 67%), and laricoids (range: 3% to 37%) to be greatest. [22] Based on these results, the current findings, not only does the Prevalence of STH levels remain constant, but the distribution trend also remains steady. We studied total dosage and choice of anthelmint or drug-resistant total hypogastrium infections in our previous paper. There are many ways that anemia and IDA could be triggered, such as insufficient food intake, issues of size (e.g., growth), and parasitic infections can coexist (e.g., thalassemia). These findings also identify and quantify a link between iron status and critical creativity. We found anemia and the IDA is significantly related to those infected with T. trichi in the current study. Studies have shown that T. trichi infected children in Panama[23] and Kenya[24] are also at an increased risk of having iron deficiency anemia and anemia/IDA Current research has shown that having found that infection with T. trichi is nearly twice as likely as previous experiments which show it to be connected to T. trichi high levels of hemolysis and IDA.T. trichi sepsis Chan infection can lead to significant blood loss due to the location of the worm Trichiniasis is, in these cases, aggravated by anemia. Hookworms in the upper small intestine and adult T. trichiura inhabit the caecum.

An initial, small amount of blood leaks out of the upper digestive tract and is reabsorbed in the intestines, causing bleeding in the small intestine. It may thus be possible for T. trichi or the malabsorptive surface of the intestines to decrease the amount of iron that is reabsorbed in the body, both of which may be related to impaired re-unionization. T. infection can also cause diarrhea that can cause dysentery and chronic blood loss of blood. In addition, we have also identified significant connections between A. lumbricoides infections and rural areas. an equally important link between rural Nigerian studies on anemia and A. lumbricoides infection has been discovered in the most recent research done in Nigeria[25]. Studies had shown that the infection rate between children in Zanzibar[26] had decreased when Hb was increased. Through the duodenum and jejunum, the iron is absorbed, and A. lumbricid is thought to be significantly decreased as a result. As far as we could determine, neither anemia nor iron status was associated with hookworm infection. The study found similar results in two Vietnamese and children, but this study was done in rural Nigeria found that many rural Nigerian children disagreed with this. Although iron ore was easily mined in East Africa, shops had also proved to be depleted even when light-colored eggs were studied. Moreover, anemia has been shown to be important in hookworm infection in previous studies. This could be due to a low infection among children since

most children have hookworms. This research also found that hookworm infection in children has a great potential to have little effect on iron status In another similar case, the iron-depleting anemia may not be a good enough indication to connect this case of anemia with hookworm. Children living in poverty were found to be the most adversely affected by iron deficiency, indicating that poor living conditions increase the risk for iron deficiency in rural areas as well as urban areas. This study demonstrates that children with lower levels of education are more vulnerable to IDA than their better-educated counterparts. Observations from rural Malaysia agree. Similarly, the Brazilian study also found that children whose parents could not read had low hemoglobin and spinal factor levels. It was revealed in this study, which was backed up by a similar study conducted on non-working non-IDA parents in India. However, according to the findings in an older study, which showed that working parent and IDA are correlated (e.g., "Two Studies"], however Until then, there was no direct connection between high housing costs and poverty. Intervention and post-control studies that compare iron status before and after the intervention could establish that IDA has a significant relationship with pre- and post-intervention factors. Some research indicates that a regular course of anthelminthic treatment promotes healthy iron levels in those infected. The research in Zanzibar and Tanzania found that a school-based iron supplementation program, which involved giving the children iron for a few months after deworming, led to significant improvements in Hb and serum ferritin levels, especially in girls who received the treatment. Finally, our results provide a current population-based iron status among children and women plus an exposure to poverty. Poverty alleviation is critical, some of the major problems affecting the population in rural areas, such as being left out of the mainstream are also It is necessary that regular de-worming, nutrition, better nutrition, sanitation, and personal hygiene are included in the program for these kids as part of the overall well-being of the entire communities.

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