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Study the effects of some intestinal and urogenital tract-parasite infection with some micronutrient deficiency among pregnant women in Babylon province /Iraq

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***Abstract*---**Intestinal parasite regarded as a big heath problem in tropical and subtropical countries such as *E.histolytica* that infect approximately 48 million person, beside a high distribution of giardiasis as well as other intestinal helminthes. Trichomoniasis is the most common cause of urinary tract infection and causing a severe complication in lower urinary tract. Anatomical and physiological changes during pregnancy would make pregnant women more exposure to parasitic infection. The present study aimed to evaluate the co-existing effects of parasitic infections and micronutrients deficiencies in the health status of pregnant women in Babylon province. Collecting of 100 samples of a stool and swab sample from pregnant women who had visit or call hospital and health care center in Babylon province. Blood sample has to be collected from each patient (5ml)by disposable syringe and then put in a gel tube (3ml) to separate it by centrifuge to obtain serum which then be used to detect the studied nutrient factors values (stored in freeze) Iron, Zinc and VitminB12. There is a relationship between parasitic infection and micronutrients deficiency among pregnant women. There is a significant association between iron deficiency and parasitic infections among pregnant women, while there is no realasionship between parasitic infection and other micronutients deficiency.

***Keywords*---**malnutrition, parasitic infection, pregnant women, micronutrient deficirency.

Introduction

Parasite is the term use to describe both a multicellular organisms (helminthes) and a unicellular organisms (protozoa) that depend on other living organisms to obtain its requirement of nutrition and to be survived within or on other organism which called host[1]. Many factors associated with parasitic infection as climate, level of education and personal hygiene[2]. In developing countries the parasite infection consider as a common cause of morbidity and mortality. Side effects of intestinal parasite infection as vitamin A deficiency, iron deficiency anemia and growth disorder[2]. Pregnant women are very susceptible to infection because the suppression in the immune system ,physiological and immunological change in the gestation period[3]. The Lowering in vitaminB12 during pregnancy can caused severe effect on mother and her infants like low birth weight, macrocytic anemia and neurological dysfunction[4]. Zinc as an essential micronutrient factor for pregnant women and her infants. Its role range from physiological growth and incorporation in DNA synthesis[5]. pregnancy make the pregnant women more susceptible to urinary tract infection because the pregnancy can bring to induce structural, functional, and physiological changes in urinary tract. Therefore pregnant women more exposure to UTI(urinary tract infection) than non-pregnant women[6].

Giardia lamella is an intestinal Pathogenic flagellated parasite also called *G.duodenum* or *G.*intestinalis. It is a parasite that found in the duodenum of human being and can Caused acute or chronic diarrhea called giardiasis[7]. *Entamoeba histolytica* is an intestinal pathogenic flagellated parasite especially in worm climate that causing amebiasis .Entamoeba can caused intestinal and extraintestial disease/infection as liver abases. It is a Common reason of death after malaria and schistosomiasis[1]. *Hymenolips nana* is a worm belong to tapeworm that caused a disease called hymenolepiasis and can infected human and rate most infection be asymptomatic and recover by itself [8]. *Trichomonas vaginalis* is Pathogenic flagellate parasite that dwell human urogenital tract and causing trichomoniasis. It can be Detected from vaginal and ureteral discharge. Trichomoniasis as a sexual transmitted disease[9].

Material and Method

Sample collection

Collecting of 100 samples of a stool and swab sample from pregnant women who had visit or call hospital and health care center in Babylon governorate from October 2021 to March 2022. Stool samples were collected in a sterile clean container. Record information of patient as age, resident, level of education, period of pregnancy, living condition (questionnaire paper) from each patient and Fresh stool examined immediately[10].

Blood collection

Blood sample has to be collected from each patient (5ml)by disposable syringe and then put in a gel tube (3ml) to separate it by centrifuge to obtain serum

which then be used to detect the studied nutrient factors values (stored in freeze) Iron, Zinc and VitminB12,

Sample examination
Stool examination
Macroscopic examination

Stool appearance can give a good thought about the present the type of gastrointestinal disease. Color, consistency, quantity, form, odor, presence of mucus. Virtually, the present of s mall amount of mucus be considered as a normal while in bloody, copious mucus will be regarded abnormal. Consistency may be watery or pasty. Color can be differed according to the type of diet. Black stool may refer to intestinal bleeding and certain medicines can cause black stool as iron or bismuth. Stool when has a red color can give an indicator of bleeding from lower intestinal tract, green color of stool is due to bile or bilirubin, clay or putty color due to biliary obstruction**[**11**].**

Microscopic examination

is an important diagnostic tool to detect protozoa, helminthes and leucocytes in fecal specimen. The normal stool meaning to has not containing of erythrocyte or leucocyte within it. Leucocyte as inflammatory indicator. Always should avoid contamination of stool with urine because it can effect on the motile stage of parasite. Three stool samples be required for definitive diagnosis but in the case of giardial infection a single sample of 50-70% of cases can be considered as a definitive diagnosis. In the case of invasive amebiasis the present of blood in the stool may be found. In some times the ingestion of erythrocytes by *E. histolytica* may be seen but not at always because it may be disintegrated by this parasite[12].

Data analysis

Statistical analysis was carried out using SPSS version 27. Categorical variables were presented as frequencies and percentages. Continuous variables were presented as (Means ± SD). ANOVA test was used to compare means between three groups. Pearson Chi-square and Fisher-Exact Test were used to find the association between categorical variables. A *p*-value of ≤ 0.05 was considered as significant[13].

Conclusion

The present study found that There is a relationship between parasitic infection and micronutrients deficiency among pregnant women. There is a significant association between iron deficiency and parasitic infections among pregnant women, while there is no realasionship between parasitic infection and other micronutients deficiency and There is no evidence confirming the parasitic infection and or with micronutrients deficiendy can cause abortion to study-infected pregnant women.

Result and Discussion

The present study were revealed the following obtained and analyzed result as showing in the following table below:

Table1: Type of Parasitic infection in all study groups of pregnant women

Type of parasite infection	Examined number	Infected No		Non infected No	
		No	%	No	%
Giardia Lamblia	100	2	2.0	98	0.93
Entamoeba histolytica	100	2	2.0	98	0.93
Trichomonas vaginalis	100	2	2.0	98	0.93
Hymenolepis nana	100	1	1.0	99	0.99
Total	100	7	7.0	93	0.93

The results of present study showed that the percent of parasitic infection in pregnant women is 0.07% from total number of sample which is 100 while percent of non-infected pregnant women is 0.93%. The present study is compatible with the previous study that showed there are many factors make parasitic infections with less frequency than other microbial infections "especially within developed countries" such as bacterial or viruses infections. In fact the severity of parasitic infection depend on the following item as dose of etiological parasite, host's infected tissue or organ, multi parasitic infection and other accompanied complication, duration of infection as acute or chronic status, tolerance and immunity level of targeted host and may be related to other unknown reason[14].

The current study showed low parasitic infections in pregnant women this may due to certain limits of the present study such as time of study ,patients refuse to give samples and the history of infection ,geographical area of study, educational levels and also may be related to the behavioral nature of pregnant women for providing of the intended study sample that were with more difficult than other patients.

Table 2: assortment of Parasitic infection among pregnant women according to period of pregnancy

Parasitic infection	Period of pregnancy			%
	First trimester	Second trimester	Third trimester	
Giardia Lamblia	2 (50.0)	0 (0.0)	0 (0.0)	28.6
Entamoeba histolytica	0 (0.0)	1 (50.0)	1 (100.0)	28.6
Trichomonas vaginalis	2 (50.0)	0 (0.0)	0 (0.0)	28.6
Hymenolepis nana	0 (0.0)	1 (50.0)	0 (0.0)	14.3
Total	4 (100.0)	2 (100.0)	1 (100.0)	100.0

The current study showed the parasitic infection occur in any trimester but more prevalence in first trimester. The current study agree with[15] which clear up that parasitic infection can occur in any stage of trimester of gestation and the infection that occur in the first trimester is more sever on fetal and can cause placental complication than those occurring in late trimester. Infection occur in

first trimester in pregnant women more severe than other stages of pregnancy. Other study show pregnancy and gestational age associated with parasitic infection and clear up the possibility of infection increased in late trimester (second and third trimester) than in first trimester. Also it show there is a relationship between parasitic infection and gravity because multigravida less possibility exposure to infection than primigravida because multigravida have previous pregnancy experience and benefits from health education and may have expertise to avoid infection unlike primigravida which don't have any previous expertise in pregnancy[16].

About trichomoniasis, a previous study done in Iran show that infection with *T. vaginalis* can occur in the second and third trimester but no infection observed in first trimester and this infection not associated with previous sexual transmitted disease or abortion[17].

Table 3: Assortment of parasitic infection among pregnant women according to type of infected system.

Infected system	Type of parasite	Infected number	%
Intestinal tract	Giardia lamblia	2	28.6
	Entamoeba histolytica	2	28.6
	Hymenolepis nana	1	14.3
Urogenital tract	Trichomonas vaginalis	2	28.6
Total		7	100.0

The present study showed a high prevalence of intestinal parasites "diagnosed by stool examination" which more than that of urogenital tract parasites" detected though swab samples". The current study is in agreement with a previous study that showed there is a high prevalence of intestinal parasites and over than 3 billion persons infected with different types of intestinal parasites around the world. The high prevalence is due to commonest route of transmission of different intestinal parasites through a contaminated food and water and this prevalence can associated with many factors that facilitate the transmission, growth and exposure to intestinal parasite as behavioral, biological, geographical and socioeconomic conditions[18]. The present study is in near with previous study of[19] that showed cyst stage of ***G. lamblia*** is responsible for transmission of the parasite that be involved in contamination of food and water . The cyst stage has a high resistant to environmental condition and can survive for months in a cold and warm condition.

The sexual transmitted parasite like *Trichomonas vaginalis* in which the human is the only host and the infection enclosed to human and have only trophozoit stage and be death quickly out human body and transport only by direct sexual contact this opinion may agree with[20] which show the parasite very fragile and die during 30 minute out the human body. The parasite have trophozoit stage only .The parasite found only in human being there is no animal reservoir [21].
In previous study done in Iran, which showed a high prevalence of intestinal parasites and the reasons for that increase were related to the presence of many factors that make it domains as suitable environment, use of human or animal fertilizers in agriculture, high population density, lack of proper disposal of waste,

lack of adequate washing of vegetables, lack of well cooked food, food handler's transmission of infection to customer's and to the presences of high resistant cyst also even larva that have the ability to penetrate skin, all these factors make intestinal parasites with high prevalence[22] .

Table 4: The mean differences of Vitamin B12 concentrations according to the type of study groups of pregnant women

Study variable	Study groups	N	Mean ± SD	F	P-value
Vitamin B12 (pg/ml)	Pathogenic infection	7	8.10 ± 1.38	0.051	0.95
	Non-pathogenic infection	51	8.01 ± 0.89		
	Control group	42	7.98 ± 0.98		

*P value ≤ 0.05 was significant.

The current study showed no significat association between VitaminB12 deficiency and parasitic infection in pregnant women and this study approximately near to another study which act on many neglected disease inclue helminthus and protozoa disease and explain that some heminthes can cause VitB12 deficiency and other can not caused. Only one person who has infected with ***Fasciolopsis buski*** that can damage the intestinal villi physiological function sever from Vitamin B12 deficiency while showing an increased in VitB12 value after three month of antiparasitic treatment of protozoal parasite [23] .

Table 5: The mean differences of serum iron concentrations according to the type of study groups of pregnant women.

Study variable	Study groups	N	Mean ± SD	F	P-value
Serum iron (mcg/dl)	Pathogenic infection	7	79.79 ± 17.77	3.252	0.043*
	Non-pathogenic infection	51	88.24 ± 49.61		
	Control group	42	116.79 ± 69.72		

*P value ≤ 0.05 was significant.

The Current study showed there is a realtionship between iron levels and parasitic infection in pregnant women (significant) that mean parasitic infection can caused iron deficiency and this study in agreement with prior study done in Egypt that showed iron deficiency anemia can effect one of every two pregnant women, and iron deficiency anemia with high prevelance in pregnant women who had three or more childern (less than 2 years) when comper with pregnant women who had one child only[24]. Furtheremore , other facter can increase the probaility of iron deficiency anemia in pregnant women as prior aboration , multiparty ,increas of maternal age ,timely tratment of illness ,health education and status of nutrient. Practically the Ages of pregnant women more than 30 years old will increaser probaility of anemia [24] .

Table 6: The mean differences of Zinc concentrations according to the type of study groups of pregnant women.

Study variable	Study groups	N	Mean ± SD	F	P-value
Zinc (mcg/dl)	Pathogenic infection	7	129.73 ± 44.33	0.789	0.457
	Non-pathogenic infection	51	132.80 ± 54.99		
	Control group	42	118.25 ± 58.80		

*P value ≤ 0.05 was significant.

The Current study showed there is no significant associated between zinc deficiency and parasitic infection in pregnant women . Other study had showed high significant association between parasitic infection and zinc deficiency and revealed that pregnant women with parasitic infection had more exposure to zinc deficiency than these pregnant women with no parasitic infection[25] . In fact, the different between both studies may due to the fact that pregnant women may receive zinc complement.

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