PARASITIC INFECTION IN PREGNANT WOMEN PRESENTED WITH ANEMIA IN FAYOUM GOVERNORATE, EGYPT

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ABSTRACT

Anemia is prevalent among pregnant women in developing countries and is associated with poor pregnancy outcomes. This study aims to assess the prevalence of parasitic infection in anemic pregnant women in Fayoum governorate, Egypt, and to estimate the effect of administration of anti-helminthic drugs on anemia with pregnancy. This study may lead to suggestions on how to better prevent and control anemia during pregnancy.

The study was performed from June 2017 to November 2019 at the antenatal care clinic in the Department of Obstetrics and Gynecology of Fayoum University hospital. In this study, 800 pregnant women were screened for anemia and this revealed that 200 pregnant women were found to be anemic. Then the anemic patients were examined for parasitic infections and this revealed 2 groups, anemia group included 92 anemic pregnant women received iron only and Anemia with parasites group included 108 anemic pregnant women with parasitic infections. This group is subdivided into 2 equal subgroups: group received iron only and another group received (iron + anti-parasitic treatment).

In the present study, the prevalence of parasitic infections in anemic patients was 54%. This established an association between intestinal parasitic infections and anemia during pregnancy.

The severity of anemia in these cases ranged from mild to moderate to severe anemia. before treatment, 7% were mild, 78% were moderately, and 15% were severely anemic. While after they received treatment with iron and anti-parasitic treatment, 93% were mildly anemic, and 7% were moderately anemic.

Keywords: Parasites, Pregnancy, Treatment, hemoglobin, Pregnancy Complications.

INTRODUCTION

Anemia during pregnancy is a well-known risk threatening both mother and the fetus with an increased incidence of maternal and fetal morbidity and mortality; it continues to be a major health problem in many developing countries.

Parasitic infections are of public health concern globally, particularly among at-risk communities as pregnant women in developing countries, These infections, directly and indirectly, lead to a spectrum of adverse maternal and fetal/placental effects, association between anemia and helminthic infestations has been seen all over the world, by eliminating them anemia may be reduced which has a positive effect on maternal and fetal outcome.

Despite its known serious effect of anemia on mothers' health, there is very little research-based evidence on this vital public health problem in Egypt (generally) and Fayoum (specifically). There are no references about the relative contribution of parasitic infections on anemia in pregnancy in Egypt; also there are no reports about the effect of administration of anthelminthic drugs during pregnancy and their impact on the improvement of anemia.

PATIENTS AND METHODS

This study aims to To investigate the local epidemiology, the types, the prevalence, and severity or intensity of anemia in Fayoum governorate, Egypt, and to To assess the effect of iron supplementation and anti-parasitic treatment on anemia in studied groups.

This prospective observational study was conducted at the antenatal care clinic in the Department of Obstetrics and Gynecology of Fayoum University Hospital. In this study, 800 pregnant women were screened for anemia and this revealed that 200 pregnant women were found to be anemic (50%). Then the anemic patients were examined for parasitic infections and this revealed two groups as follows:

1- **Group I (Anemic only)**: included 92 anemic pregnant women who received iron only.

2- Group II (Anemic and infected by parasites): included 108 anemic pregnant women with parasitic infections. This group is subdivided into 2 equal subgroups:

Group (II A): received iron only.

Group (II B): received (iron + antiparasitic treatment).

All patients in the study were subjected to:

Questionnaire: Detailed history was recorded.

Diagnosis of anemia was done by Complete blood count (CBC), Hb level and measuring hematocrit concentration.

Diagnosis of parasitic infection was done using stool analysis, stool culture for *B. hominis* parasite, and complete urine analysis.

Obstetric ultrasound (U/S) was done to assess fetal development.

RESULTS

Anemia affects large numbers of pregnant women in developing countries**.** The overall prevalence of anemia during pregnancy was 50%. The mean Hemoglobin level of women without any parasite was 9.92 ± 0.85 g/dl. The mean Hemoglobin level of women with parasitic infections was 8.94 ± 1.01 g/dl.

The overall prevalence of parasitic infections in anemic patients was 54%. The identified intestinal parasitic infections were *E. vermicularis* 46 (43 %)/ mixed infection 21 (19 %) / *Ascaris lumbricoid* 13 (12%) / *Hymenolepis nana* 10 (9%) / *Entamoeba histolytica* 9 (8%) / *Giardia lamblia* 7 (7%) / *Ancylostoma doudenale* 2 (2%).

Stool culture for *B. hominis* on Jones' Medium was positive in (31 %) in the anemia with parasites group. This suggests a strong relation between IDA and infection by *B. hominis*.

The anemia in pregnant women was found significantly associated with all parasitic infection particularly *E. vermicularis* and mixed infections.

Follow up after treatment revealed that the mean Hemoglobin level of women who received iron and anti-parasitic treatment was 11.20 ± 1.16 g/dl. The mean Hemoglobin level of women who received iron only was 10.31 ± 0.79 g/dl. The mean values of Hb were significantly increased in group two after treatment, these results suggests interaction between intestinal parasitic infections and anemia with pregnancy.

After treatment, in the anemic pregnant women with parasite treatment therapy, 93% were mild, and 7% were moderate. While before treatment, 7% were mild, 78% were moderately, and 15% were severely anemic.

DISCUSSION

The study established that intestinal parasitic infections are an underestimated public health problem among pregnant women and it needs more concern about it.

In the present study, when comparing the serum hemoglobin level among the studied groups, the result of the present work showed that there was a highly significant difference regarding serum hemoglobin levels in the anemia with parasite group when compared to the anemia group.

These results agree with Gedefaw et al. who had determined the prevalence and associated risk factors of anemia among pregnant women and they reported that the pregnant women who had intestinal parasitic infection were more likely to be anemic than pregnant women who did not have intestinal parasitic infections.

These results disagree with another study that studied the prevalence of Anemia among Pregnant Women Attending Antenatal Care and showed the majority of pregnant women were of the mild type of anemia and they had intestinal parasitic infections.

The recorded parasitic infection in this study were *Enterobius vermicularis* 46 (43 %) and mixed infection 21 (19 %) followed by *Ascaris lumbricoid* 13 (12%) then, *Hymenolepis nana* 10 (9%) then, *Entamoeba histolytica* 9 (8%) then, *Giardia lamblia* 7 (7%) then, *Ancylostoma doudenale* 2 (2%).

This is in agreement with a previous study reported that the prevalence of parasitic infections is higher in tropical and sub-tropical areas where conditions favor their survival and transmission.

Another study was done at Al-Fayoum University's Hospitals by SAFAR AND ELDASH (2015) about the prevalence of parasitic infection in children and reported that *E. histolytica* was the commonest organism (50.3%) followed by *E.vermicularis* (34.4%), *G.lamblia* (12.1%), then *H. nana* (8.3%). Both *A. lumbricoides* and *A. duodenal* were (12.7%).

In the present study, *E. histolytica* was 8%. In a previous study in Egypt, *E. histolytica* was reported to have a prevalence that ranged from 0 to 57% in diarrheic patients, with greater infection rates in poor regions and Upper Egypt.

Positive stool culture for *B.hominis* parasite showed more severe anemia than the negative stool culture and the severity of anemia decreased significantly after treatment of parasitic infection. After treatment, there was a significant improvement in anemia.

Fonte et al. (2019) also found that the proportion of pregnant women suffering from IDA was significantly higher in the group of gravid women parasitized by *Blastocystis* spp. than in those not infected by that protozoon.

International guidelines recommend mass deworming during pregnancy with or without prior investigations for pregnant women living in areas where these infections are highly prevalent. Failure of diagnosis may be explained with the poor quality of the laboratory as this study was performed in, where the technicians are not well-trained. In addition to examination of many stool samples are reacquired to confirm the diagnosis and the use of immunodiagnostic tests.

For this reason, this study recommends the provision of high standard well-equipped

Parasitology laboratory and standardized parasitological examination for all anemic pregnant women.It is recommended that stool examination should be done as a routine during antenatal care visits should to detect parasitic infections in pregnant women and treat the infected women.

CONCLUSION

In conclusion, understanding the relationship between parasitic infections and anemia with pregnancy women would require further study. The current study reflects the need of routine stool analysis among pregnant women in rural and endemic areas for intestinal parasites. Even more, further additional research on pregnant intestinal parasitic infection impact on newborn health is on-going.

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Diagnosis of anemia among the studied groups:

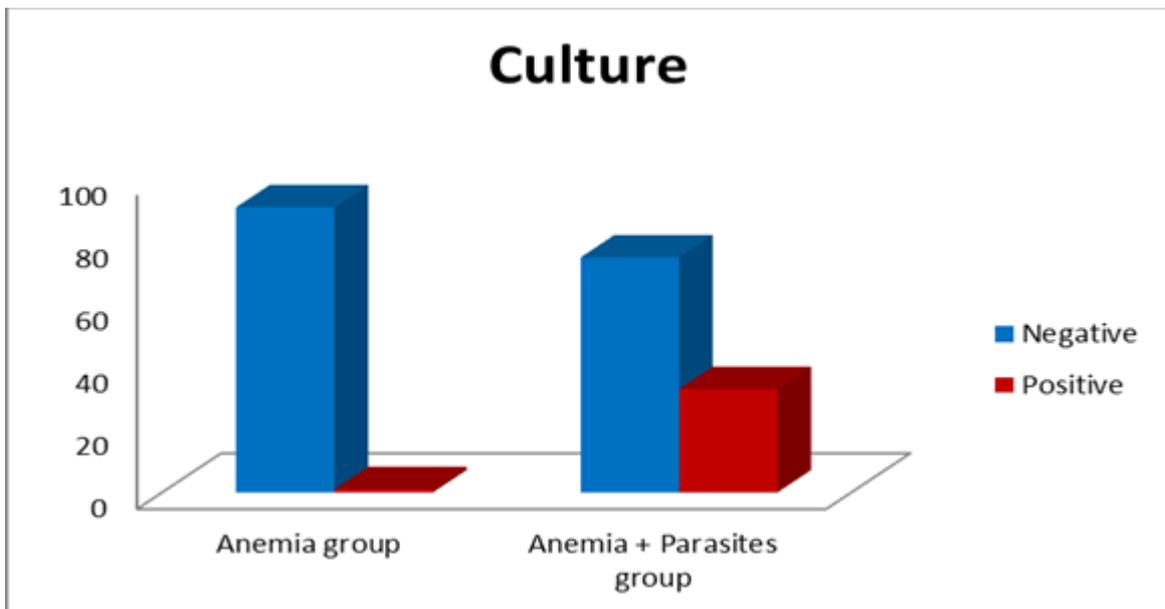|	Group I (N=92)		Group II (N=108)		P value
	Mean	**± SD**	**Mean**	**± SD**	
HB (gm./ dl)	9.92	0.85	8.94*	1.01	< 0.001
HCT (%)	31.43	2.28	30.09*	3.03	< 0.001

* Significant difference.
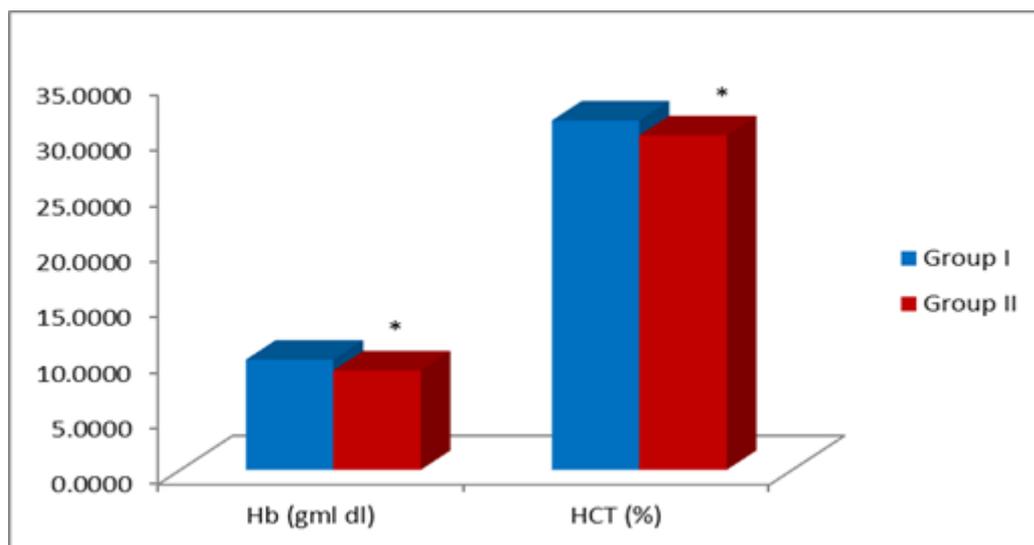
Diagnosis of anemia among studied groups.

* Significant difference.
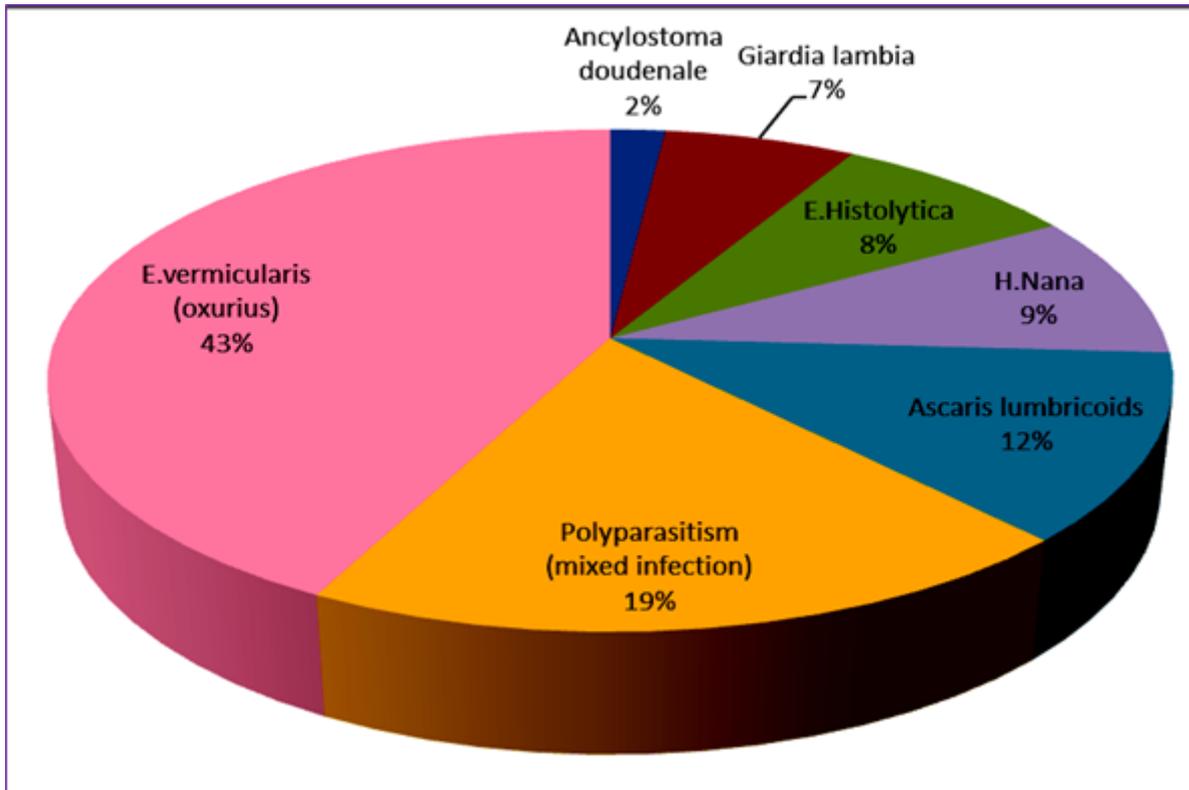
Prevalence and types of intestinal parasites.

Stool culture for *Blactocyst hominis* among pregnant women.

* Significant difference.

Follow up of anemia (mean Hb level ± SD) among the studied groups:

	Group I (N=92)		Group IIA (N=54)		Group IIB (N=54)		P value
	Mean	**± SD**	**Mean**	**± SD**	**Mean**	**± SD**	
Hb (gm./ dl)	10.58	0.63	10.31	0.79	11.20*	1.16	< 0.001

* Significant difference.

Severity of anemia before and after treatment among the studied groups (number and percent of cases):

	Before treatment		After treatment	
	Frequency of cases	**%**	**Frequency of cases**	**%**
Mild	87	43.5	175	87.5
Moderate	99	49.5	25	12.5
Severe	14	7	-	-