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CASE REPORT

Helminth Infestation Causing Anaemia in Pregnancy Attending Primary Care Clinic: A Case Report

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ABSTRACT

Anaemia in pregnancy is among the commonest medical disorders encountered antenatally. However, the condition has sometimes been overlooked and not corrected accordingly given wrong or unidentified exact causes. Helminth infestation, even though rare generally nowadays, is still an important cause that needs to be ruled out in case of anaemia. We reported a case of an antenatal woman who presented with unresolved anaemia. However, she benefited from the helminth infestation screening and was able to be treated well. Her condition tremendously improved after the eradication of the infection. This case highlighted that anaemia should always include stool for ova and cyst despite no convincing history towards the infection. The symptoms could be mild or even not recognised.

INTRODUCTION

Pregnancy anaemia is characterised by decreased red blood cells or haemoglobin in the maternal bloodstream. This condition can lead to decreased tissue oxygen delivery, resulting in fatigue, weakness, and other symptoms (Frayne & Pinchon, 2019). Furthermore, anaemia in pregnancy is associated with adverse outcomes for both the mother and the developing foetus. There are many causes of anaemia in pregnancy,

such as haemodilution, maternal iron deficiency, vitamin B12 deficiency, and folate deficiency, as well as genetic disorders such as haemoglobinopathy, especially thalassemia trait (Frayne & Pinchon, 2019; Miller, 2013; Petrakos et al., 2016). Nevertheless, certain infections, such as helminth infestations, particularly hookworm, have been identified as a significant contributor to anaemia in pregnant women (Nurdiati et al., 2001; Wahed et al., 2020).

The usual workup for anaemia in pregnancies includes full blood count, iron studies, and other specific tests to determine the underlying cause of the anaemia (Frayne & Pinchon, 2019; Miller, 2013). However, screening for helminth infestations in pregnant women may not be routine, and therefore, such infestations may go unnoticed in many cases. Therefore, a specific clinical hint should be identified to screen the case earlier for better outcomes (Nurdiati et al., 2001; Wahed et al., 2020). We highlighted a case of anaemia in pregnancy that benefits from an appropriate helminth work-up despite vague hints in history and clinical presentation.

CASE PRESENTATION

A 27-year-old (Gravida 2 Para 0+1) at 24 weeks period of amenorrhea came to the primary care clinic for her regular antenatal follow-up. She complained of occasional palpitations and fatigue since early pregnancy. She had no shortness of breath, dizziness or other symptoms of anaemia. Her fetal movement was good. She had no history of vaginal bleeding, melena or blood loss. She complies with her antenatal haematinic (Zincofer), which contains 100mg of elemental iron in the ferrous form. She also has been taking her meals regularly. She has no known medical illness. She had a history of spontaneous abortion during eight weeks of amenorrhea in 2022. Her family members are well, without any history of thalassemia or anaemia.

On examination, she was alert with mild pallor. Her hydration was good. Her blood pressure was 122/71 mmHg, and her pulse rate was 101bpm. Her weight was 59kg, with a body mass index of 24kg/m^2. Obstetric examination revealed a singleton foetus with fundal height corresponding to 24 weeks of gestation. Other system examinations are unremarkable.

Her haemoglobin was 10.9g/dl. Her full blood count is as follows:

Table 1 Initial full blood count result.

Parameter	Result	Normal value
WBC (x109/L)	9.3	4.0-11.0
RBC (x1012/L)	3.78	3.9-5.6
HB (g/dL)	10.9	12.0-16.0
HCT (%)	30	35-47
MCV (fl)	73	76-96
MCH (pg)	26.7	28-34
MCHC (g/dL)	33.2	30-36
Platelet (x109/L)	244	150-400
RDW	14	12.4-15.1
Ferritin (ug/L)	9	11-300
TIBC (ug/dL)	88	50-170

She was compliant with her medications and high-iron diet advice. Her symptoms persist till her subsequent follow-up at 28 weeks period of gestation. Despite coming from a high-income group, with no recent travel to the seaside or sand and no concomitant gastrointestinal symptoms, we arranged for stool ova and cyst, which reveals the presence of hookworm infestation. She was treated with one course of Albendazole 400mg for three days and was given an appointment for follow-up. She remains well with good weight gain. Her haemoglobin level has increased to 11.5g/dl, as shown in Table 2. Her transabdominal ultrasound reveals normal foetal growth according to her gestational age.

Table 2 Full blood count result after deworming treatment.

Parameter	Result	Normal value
WBC (x109/L)	8.06	4.0-11.0
RBC (x1012/L)	4.52	3.9-5.6
HB (g/dL)	11.7	12.0-16.0
HCT (%)	41.6	35-47
MCV (fl)	92	76-96
MCH (pg)	29.5	28-34
MCHC (g/dL)	30.8	30-36
Platelet (x109/L)	253	150-400
RDW	14.93	12.4-15.1
Ferritin (ug/L)	38	11-300
TIBC (ug/dL)	68	50-170

DISCUSSION

Anaemia, a condition characterised by a decrease in red blood cells or haemoglobin levels in the blood, is prevalent among pregnant women worldwide (Frayne & Pinchon, 2019). The connection between malaria and anaemia in pregnancy is well-established, but recent studies have also found a correlation between helminthic infestations and anaemia during pregnancy (Miller, 2013; Nguyen et al., 2006; Nurdiati et al., 2001). Studies conducted in Indonesia have identified that 69.7% of pregnant women are infected with helminths, specifically *Trichuris trichiura* followed by *Necator americanus* (hookworm) and is a significant contributor to anaemia in the second trimester of pregnancy (Nguyen et al., 2006; Nurdiati et al., 2001).

The exact mechanism by which helminthic infestations induce anaemia in pregnancy is not clearly understood. However, it has been suggested that these infections decrease erythropoiesis by releasing nitric oxide. Nitric oxide can reduce the deformability of erythrocytes, leading to increased red blood cell destruction (Wijshake et al., 2023). Helminthic infestations during pregnancy can have several detrimental effects on both maternal and foetal health (Mpairwe et al., 2014). These infections can lead to malnutrition, iron deficiency anaemia, and increased vulnerability to other infections in infected pregnant women (Miller, 2013; Mpairwe et al., 2014; Wahed et al., 2020). Furthermore, helminth infestations, particularly hookworm infestations, have been identified as significant contributors to severe anaemia during pregnancy in Sub-Saharan Africa (Brooker et al., 2007). Studies have shown that helminthic infestations during pregnancy, such as hookworm infestations, can cause occult or overt intestinal blood loss due to mucosal or submucosal invasion, further exacerbating anaemia (Mpairwe et al., 2014; Wijshake et al., 2023). Foetal complications such as foetal growth restriction and low birth weight can also arise (Brooker et al., 2007; Mpairwe et al., 2014).

Screening and management strategies for helminthic infestations in pregnant women are crucial to prevent and treat anaemia (Blackwell, 2016). First, stool ova and cysts should be included in the anaemia workup and made routine even if the procedure is troublesome. The management of helminth infestations, particularly in pregnancy and anaemia, requires a comprehensive approach. This approach includes both prevention and treatment strategies. Prevention measures should include education on proper hygiene practices, such as handwashing and the importance of a clean water supply. A patient from high economic status is not equivalent to good hygiene practice in which the advice should be generalised to all (Blackwell, 2016; Brooker et al., 2007; Nurdiati et al., 2001). Additionally, implementing deworming programs in endemic areas can help reduce the prevalence of helminthic infestations among pregnant women (Nguyen et al., 2006; Nurdiati et al., 2001). Treatment strategies for helminth-induced anaemia in pregnancy often involve the use of anthelmintic medications, such as albendazole or mebendazole. These medications effectively eliminate helminthic infestations and reduce the associated intestinal blood loss, thus improving anaemia (Brooker et al., 2007; Mpairwe et al., 2014;

Nguyen et al., 2006). In terms of safety, both albendazole and mebendazole are safe for use during pregnancy. Furthermore, these medications are inexpensive and readily available, making them accessible in resource-limited settings (Brooker et al., 2007; Nguyen et al., 2006).

In this case, our patient had anaemia, which was diagnosed in the second trimester. Her anaemic workup showed iron deficiency anaemia, confirmed with a low ferritin count. The uniqueness of this case is that there are no specific risk factors to suggest this patient had any worm infestation. She did practice good hygiene at home. She also had good financial resources with a high monthly income. According to our Perinatal Manual Care, local guidelines on managing anaemia in pregnancy also state that investigation for stool ova and cyst is optional and not warranted for all cases (Ministry of Health, 2013). Nevertheless, our case has benefited from a stool sample investigation given persistent low ferritin levels despite good compliance to a high iron diet and haematinics. This is a striking clue that should not be missed. Low ferritin furthermore does not favour thalassemia. The stool result shows helminth infestations, which were treated with Albendazole. Subsequently, her anaemia improved, and foetal growth is normal for gestational age.

CONCLUSION

Anaemia in pregnancy is fairly common. However, screening for causes of anaemia at primary care levels should also include screening for intestinal parasitic infestations. In some communities, opportunistic screening for intestinal parasitic infestations may benefit all antenatal women. This rare but possible anaemia cause must be suspected, especially when other common causes have been ruled out at the initial phase.

CONFLICT OF INTEREST

The authors declare that they have no competing interests in publishing this case.

CONSENTS

Written informed consent was obtained from the patient to publish this case. A copy of the written consent is available for review by the Editor-in-Chief.

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