CASE REPORT

Iron Deficiency Anaemia with Underlying Beta-Thalassaemia Carrier in a Single Mother with Multiple Substance Abuse: A Case Report

Mohd Faznynell Idris[1], Aneesa Abdul Rashid[1]

ABSTRACT

Anaemia in pregnancy is a common condition in primary care, and severe cases require prompt intervention. We report a 23-year-old single mother with a history of smoking and substance abuse who was diagnosed with severe iron deficiency anaemia in late pregnancy and later developed postpartum haemorrhage. Although asymptomatic, she required admission, blood transfusions, and parenteral iron. Her substance use complicated her management. Further tests confirmed a beta-thalassaemia trait, prompting family screening. This case highlights the importance of a multidisciplinary approach in high-risk pregnancies.

Keywords: Anaemia in pregnancy, iron deficiency anaemia, thalassaemia

International Journal of Human and Health Sciences Vol. 09 No. 03 July'25

DOI: http://dx.doi.org/10.31344/ijhhs.v9i3.833

INTRODUCTION

Anaemia in pregnancy is a prevalent yet preventable condition[1]. About 30% of women of reproductive age are anaemic,[2,3] with 19.3-57.4% of pregnant women affected[4]. Iron deficiency anaemia (IDA) is one of the most common causes, and thalassaemia may coexist. Substance abuse, particularly smoking and amphetamine use, further worsens anaemia by reducing blood flow and oxygen to the foetus[5]. These factors are often linked to complications, socioeconomic challenges, poor antenatal attendance, and reduced treatment compliance. Early management is crucial, as untreated anaemia can lead to severe complications such as postpartum haemorrhage. Most guidelines recommend achieving a haemoglobin (Hb) level of 11 g/dL by 36 weeks[6], yet many women struggle to reach this target.

CASE REPORT

A 23-year-old single mother, gravida 3 para 2, presented late for booking at 34 weeks of gestation. She was referred from a health clinic to a tertiary hospital for severe anaemia for investigation. Her Hb was found 6.7 g/dL. Otherwise, she was asymptomatic but had a history of smoking and amphetamine use starting at 15 years old. On examination, she appeared pale but had normal vital signs. Abdominal examination showed a gravid uterus corresponding to a 34-week gestation. She was admitted to the obstetrics and gynaecology ward and received two pints of packed red cells on the first day. An anaemia work-up was performed. Peripheral blood film (PBF) showed a hypochromic microcytic picture, and serum ferritin level of 10 µg/L confirmed iron deficiency anaemia. She was started on the first cycle of intravenous iron therapy, with her Hb improving from 6.7 g/dL to 7.8 g/dL. She was co-managed by the medical and psychiatric teams for her anaemia and substance abuse, respectively. She was discharged with follow-up appointments for another cycle of intravenous iron therapy, psychiatric appointments, and a quit-smoking clinic follow-up. At her second

1. Department of Family Medicine, Faculty of Medicine and Health Sciences, Universiti Putra Malaysia, Selangor, Malaysia.

Correspondence to: Dr. Aneesa Abdul Rashid, Department of Family Medicine, Faculty of Medicine and Health Sciences, Universiti Putra Malaysia, Selangor, Malaysia. Email: aneesa@upm.edu.my

admission, she had missed her follow-up appointment, prompting a home visit where she displayed aggressive behaviour, suggesting drug influence. A urine drug test showed positive for amphetamine and methamphetamine. She was subsequently admitted for monitoring of substance withdrawal symptoms and received a second cycle of intravenous iron therapy. In the ward, she was well with no anaemic or withdrawal symptoms. However, on the next day, she experienced contraction pain and subsequently went into labour. She delivered a baby girl at 36 weeks and five days but experienced postpartum haemorrhage due to uterine atony, which was managed effectively. She was discharged with a follow-up for Hb monitoring and postpartum care to the primary health clinic. At the health clinic, her Hb improved from 8.9 g/dL to 11.5 g/dL. Despite such improvement, her full blood count (FBC) continued to show low mean corpuscular volume (MCV) and mean corpuscular Hb (MCH), prompting further investigation for secondary causes. Hb electrophoresis revealed an elevated HbA2 with a normal HbF level, leading to a diagnosis of beta-thalassaemia trait. The patient received counselling on thalassaemia and was advised to undergo family screening, including screening for her newborn.

DISCUSSION

The World Health Organization (WHO) classifies pregnancy-related anaemia as mild (10 to 10.9 g/dL), moderate (7 to 9.9 g/dL), and severe (<7 g/dL)[3]. Mild and moderate anaemia can be managed at the primary care level with oral iron supplementation, whereas severe anaemia requires urgent intervention, often including blood transfusions. In this case, her Hb was 6.7 g/dL, placing her at immediate risk of heart failure, which prompted referral to the tertiary hospital. Blood transfusion was given to achieve a target Hb level of 10-11 g/dL before labour. Once stabilised, it is essential to identify the underlying cause through detailed history, physical examination, and appropriate investigations.

The WHO recommends screening all pregnant women for anaemia at the booking visit and again at 28 weeks of pregnancy[7]. In this case, FBC done at her booking showed an Hb of 6.7 g/dL, with MCV of 62.5 fL and MCH of 17.6 pg, indicating severe hypochromic microcytic anaemia for investigation. Since the patient's FBC showed severe hypochromic microcytic anaemia, the next step was to investigate the underlying cause through an anaemia work-up. These included PBF, iron studies, stool ova and cysts, Hb analysis, and blood smear for malaria parasite (BSMP). In this case, PBF showed an IDA picture with evidence of hypochromic microcytic and teardrop cells. The diagnosis was further confirmed by a serum ferritin level of 10 µg/L. However, Hb analysis and BSMP are not routinely performed as first-line investigations and are only indicated when clinically warranted. This patient had no family history of thalassaemia, her red blood cell indices were normal, and iron studies suggested IDA. Nevertheless, due to persistently low MCV and MCH despite a subsequent improvement in Hb level, a haemoglobin analysis was performed later, which revealed that she was a β-thalassaemia carrier.

Appropriate treatment is crucial for preventing recurrence, depending on the cause, severity, and potential complications. Mild to moderate anaemia can be managed with oral iron supplements, typically 120-180 mg of elemental iron daily[6]. Haemoglobin levels should increase by 1-2 g/dL within 2-4 weeks[8]. If oral iron therapy is ineffective or not tolerated, parenteral iron therapy is an alternative. In this case, she was given intravenous iron therapy with a total dose over three cycles. In severe cases where Hb falls below 7 g/dL or if a patient develops symptomatic anaemia, regardless of the haemoglobin level, a referral to the tertiary care centre for blood transfusion is necessary. In this case, she was transfused with two pints of packed cells because her Hb level was 6.7 g/dL. The goal is to raise Hb levels to 10-11 g/dL before labour.

The patient's history of smoking, which began at age 15, indirectly affected both mother and foetal health. Despite attempts to reduce cigarette use during pregnancy, the combined effect of smoking and anaemia likely worsened foetal hypoxia, increasing risks of developmental delays and low birth weight. This synergistic effect can lead to more severe adverse outcomes such as intrauterine growth restriction and preterm birth[6]. In this case, the combination of anaemia and substance use likely created a more hostile intrauterine environment, contributing to preterm delivery at 36 weeks. Studies also show that anaemia in pregnancy is linked to a higher risk of neurodevelopmental disorders such as

autism spectrum disorder and attention deficit hyperactivity disorder[8]. Managing addiction during pregnancy requires a multidisciplinary team approach involving obstetricians, psychiatrists, and family medicine specialists. Routine screening for substance use should be part of antenatal care. In this case, the patient was co-managed with psychiatric and addiction services. Although anaemia was the main presenting problem, it created an opportunity to address her substance use and psychosocial issues. Managing her condition opened avenues for behavioural change, as motherhood often motivates healthier choices. A holistic, empathetic, and non-judgemental approach, as emphasised in Islamic teachings, can foster trust and improve outcomes for both mother and child. Lastly, management of anaemia continues into the postpartum phase. Women are advised to continue oral iron supplementation for at least three to six months after delivery or until their Hb levels normalise[6]. Regular follow-up and blood tests should be conducted postpartum to monitor Hb levels and iron stores, as well as to ensure sustained recovery, prevent relapse, and address any long-term impact on both mother and child.

CONCLUSION

Severe anaemia in pregnancy requires early intervention, comprehensive antenatal care, and attention to underlying conditions such as substance abuse and genetic disorders. This case highlights the importance of a holistic approach to improving outcomes for both mother and child, especially in high-risk groups.

Conflict of Interest: None declared.

Funding Statement: No funding.

Ethical Clearance: Written informed consent of the patient and permission from the hospital authority were obtained.

Authors' Contribution: MFI contributed to patient selection, data collection, and drafting; AAR supervised and reviewed the report.

REFERENCES

1. Frayne J, Pinchon D. Anaemia in pregnancy. Aust J Gen Pract. 2019;48(3):125-9.
2. Ali N, Kalmi ZN, Sanusi NS, Ahad A, Khairuddin NAM, Rosman SR, et al. Retrospective review of the prevalence and risk factors of anaemia among antenatal mothers attending health clinics in Alor Gajah, Melaka. Malaysian Fam Phys. 2022;17:137-43.
3. World Health organization (WHO). Haemoglobin concentrations for the diagnosis of anaemia and assessment of severity. Vitamin and Mineral Nutrition Information System (VMNIS). Geneva: WHO; 2011.
4. Abd Rahman R, Idris IB, Isa ZM, Rahman RA, Mahdy ZA. The prevalence and risk factors of iron deficiency anemia among pregnant women in Malaysia: a systematic review. Front Nutr. 2022;9:847693.
5. Forray A. Substance use during pregnancy. F1000Res. 2016;5:F1000 Faculty Rev-887.
6. Ministry of Health, Malaysia. Perinatal care manual. 4th ed. Kuala Lumpur: Ministry of Health, Malaysia; 2022.
7. Sungkar A, Surya R. Blood transfusion in obstetric cases. Indones J Obstet Gynecol (INAJOG). 2020;8(3):197-200.
8. Wiegersma AM, Dalman C, Lee BK, Karlsson H, Gardner RM. Association of prenatal maternal anemia with neurodevelopmental disorders. JAMA Psychiatry. 2019;76(12):1294-1304.