Severe Iron-Deficiency Anemia on Maternal and Neonatal Outcomes

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Abstract

The effects of severe iron-deficiency anemia in pregnancy on maternal and neonatal outcomes were investigated in a relatively deprived inner-city population in a North London hospital. 212 pregnant women were included in the case-control study. 106 had haemoglobin (Hb) < 8 g/dl recorded at any point during their pregnancy. The control group, 106 women, had Hb >11 g/dl throughout pregnancy. The study group lost an average of 80 ml more blood at delivery and had higher rates of postpartum haemorrhage than the control group. However, severe anemia did not affect other maternal or neonatal outcomes; these may have been confounded by antenatal management with oral haematinics or blood transfusion.

Keywords: Anemia; Neonatal outcomes; Pregnancy; Postpartum haemorrhage

Introduction

Anemia affects a large proportion of pregnant women in developing countries, 56% compared to 18% in developed countries. Past research has suggested an increase in maternal and neonatal morbidity and mortality in mothers presenting with severe anemia in the antenatal period. In particular, iron-deficiency anemia contributes to approximately 111,000 deaths/year among pregnant women and is associated with higher rates of peripartum haemorrhage and infection. Anemia is also related to poor neonatal outcomes, such as preterm delivery, low birth weight, low Apgar scores and intrauterine fetal death [1-5].

Previous research of anemia in pregnancy in the developing world has demonstrated a link between maternal anemia and newborn anemia and perinatal morbidity and mortality. In addition, studies have shown a greater risk of preterm delivery and low birth weight amongst anemic mothers [6-9].

Nevertheless, the current understanding of the relationship between anemia and pregnancy related outcomes is still incomplete. Most of the studies are from developing countries where prenatal care, monitoring and treatment of low haemoglobin (Hb) levels are not routinely available. In developed countries, such cases are closely monitored and rarely left untreated. For example, in the United Kingdom, severe anemia is often managed with oral haematinics, parenteral iron or blood transfusion. However, in relatively deprived inner-cities of London, it is unclear whether anemic mothers who had received intervention had similar recoveries to those of higher socio-economic status. The study compared the effects of severe anemia (Hb < 8 g/dl) during pregnancy on maternal and neonatal outcomes within the population of a North London hospital where the majority of the patients are from the inner city.

Materials and Methods

The study was conducted at the North Middlesex University Hospital (N MUH) [10], serving the third poorest borough in London. All women had delivered at the maternity unit from 1st January 2001 to 31st December 2010. The study group comprised of women who had confirmed iron-deficiency anemia with recorded Hb < 8 g/dl at any point during the pregnancy. Pregnant non-anemic woman (Hb > 11 g/dl throughout the pregnancy) formed the control group. Outcomes such as gestational age, duration of second stage of labour, mode of delivery, postpartum haemorrhage (PPH), birth weight, Apgar scores, neonatal intensive care unit (NICU) admissions and peripartum complications were recorded. Socio-demographic and transfusion related outcomes were also investigated in the study population. Exclusion criteria included those with incomplete medical records, multiple births, non-iron deficient anemia and patients with haemoglobinopathies (i.e. thalassemia and sickle cell anemia).

Results

The demographics and haemoglobin mean measurements for both groups are summarised in Table 1.

<table>
<thead>
<tr>
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<th>Controls</th>
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<td></td>
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<tr>
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transfused antenatally, but despite this, the case group was still by anemic women were from a lower social class, with 74.7% belonging to higher rates of PPH (27 patients vs. 12 patients, p = 0.012). However, there were no statistically significant differences between all other outcomes measured (Table 2).

### Table 1: Demographics and mean haemoglobin levels of the cases and controls (n = number of patients; Hb = Haemoglobin; SD = Standard deviation).

All cases were commenced on oral iron (ferrous sulphate 200 mg tds as per hospital protocol) and 14 of the 106 cases (13.2%) were transfused antenatally, but despite this, the case group was still by definition anemic, with a mean pre-delivery Hb of 10.1 g/dl.

Severe anemic mothers lost an average of 80 ml more blood at delivery than the control group (380 ml vs. 290 ml, p = 0.032) with higher rates of PPH (27 patients vs. 12 patients, p = 0.012). However, although the increased blood loss was statistically significant, it was not likely to be of any clinical relevance as this difference was only 80 ml. All other maternal and neonatal outcomes were not statistically significant between the two groups.

These findings appeared different from similar studies based on groups from Asia (UNICEF MDGs 2015; Rohilla et al.), where anemic women had significantly worse outcomes. The lack of adverse effects could have been due to the efficacy of the intervention of the administration of iron supplementation and, in very severe cases, blood transfusions. Clearly, it would have been unethical to withhold oral haematinics from severely anemic mothers.

The fact that three-quarters of the studied patients came from a relatively deprived background (social class 5) might explain the prevalence of anemia and highlights the fact that the poorer boroughs in London are still facing challenges similar to those found in some developing countries and must prioritise improving their socioeconomic, health and educational status.

### Acknowledgements

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### References

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