Hepcidin levels in pregnant women on iron replacement therapy

YVONNE CHIBANDA1, HANNAH COOKE1, DAVID CHURCHILL2 AND HAFID OMAR AL-HASSI1

1Research Institute in Healthcare Science, Faculty of Science and Engineering, University of Wolverhampton WV1 1LZ; 2The Royal Wolverhampton Hospital NHS Trust, Wolverhampton, WV10 0QP

To compare standard iron status testing with serum hepcidin in pregnant women with IDA at diagnosis and in response to maternal iron replacement.

Samples were collected at 4 separate visits (visits 1-3 and puerperium/visit 5) in accordance with BSH guidelines of visit frequency.

Levels of serum ferritin and hepcidin were measured at first, second, third visits and puerperium (n=20) by quantitative sandwich Enzyme-linked immunosorbent assay before and after 100-200mg/day iron therapy. A paired two-tailed t-test was utilized and p-value of <0.05 was considered as statistically significant. Linearity was determined by Pearson's correlation coefficient.

The serum hepcidin values were significantly increased in puerperium (12.70ng/ml) compared with first, second and third visits, 7.56ng/ml, 7.25ng/ml and 6.72ng/ml, respectively (p<0.002).

Serum hepcidin levels significantly correlated with those of ferritin (r=0.99, p<0.01).

Iron deficiency anaemia (IDA) during pregnancy is highly prevalent with up to 30% of pregnant women affected in the UK. In pregnancy it is treated with oral iron as recommended in the British Society for Haematology (BSH) UK guidelines. However, treatment is problematic with up to a third of women failing to respond to the standard therapy. It has been suggested that a more accurate diagnosis of iron deficiency and assessment of response to treatment can be obtained using other markers of iron metabolism. One such marker is hepcidin, which controls iron absorption from the gut and its release into circulation from macrophages.

DISCUSSION

• Diagnosis of Iron deficiency anaemia using current tests has its limitations in determining iron status during pregnancy. These include the impact of inflammation on each analyte.
• Iron replacement therapy prescribed as oral iron is not always suitable for pregnant women diagnosed with IDA, due to gastrointestinal side effects, as well as inadequate dosage. Intravenous iron can be prescribed once non-response to oral iron is established, however, this is costly and treatment delays may have a negative impact on maternal and foetus outcomes.
• Hepcidin and ferritin results show a strong increment correlation in response to iron replacement therapy. This is indicative of low/blocked iron absorption. One way to avoid this is to lower the dose of iron prescribed.

Acknowledgements We would like to thank all who supported and advised during this project, in particular the healthcare research department at the University of Wolverhampton.

References