An audit of cell free fetal DNA (cffDNA) screen to avoid administration of anti-D immunoglobulin in RHD negative pregnant women with RHD negative fetus.

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Introduction

Anti-D immunoglobulin prophylaxis has been the standard treatment in reducing the incidence of haemolytic disease of fetus and new born (HDFN). A significant proportion (40%) of RHD negative pregnant women carry RHD negative fetuses and therefore receive anti-D immunoglobulin unnecessarily (Qureshi et al, 2014). The National Institute for Health and Care Excellence (NICE) recommends fetal RHD genotyping as a cost effective option to guide antenatal prophylaxis with anti-D immunoglobulin (NICE, 2016). International Blood Group Reference Laboratory (IBRGL) provides the diagnostic service to NHS Blood and Transplant (NHSBT). The Hillingdon Hospitals NHS Foundation Trust was one of the first NHS trusts in London to introduce the cell free fetal DNA (cffDNA) screen for RHD status in March 2017. The aim of the audit was to compare local clinical practice against the local and NICE guidelines in the context of cffDNA screening in RHD negative pregnancies. The proportion of pregnancies with RHD positive and negative foetuses, and false negative and positive cases were also reviewed.

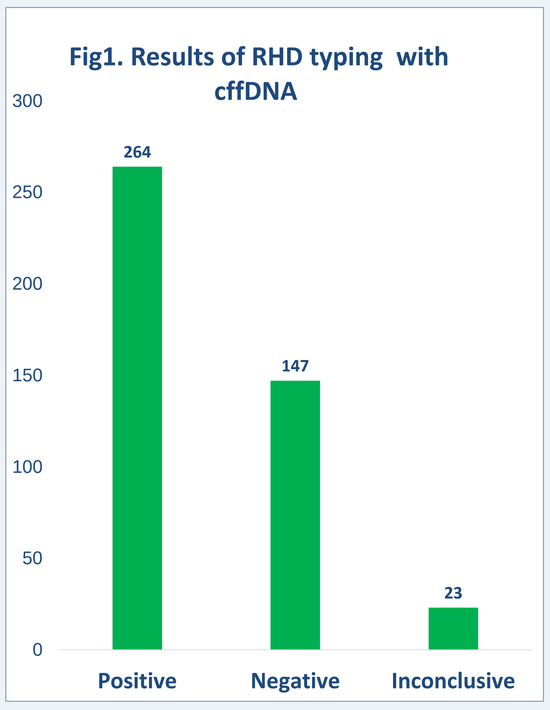
Methods

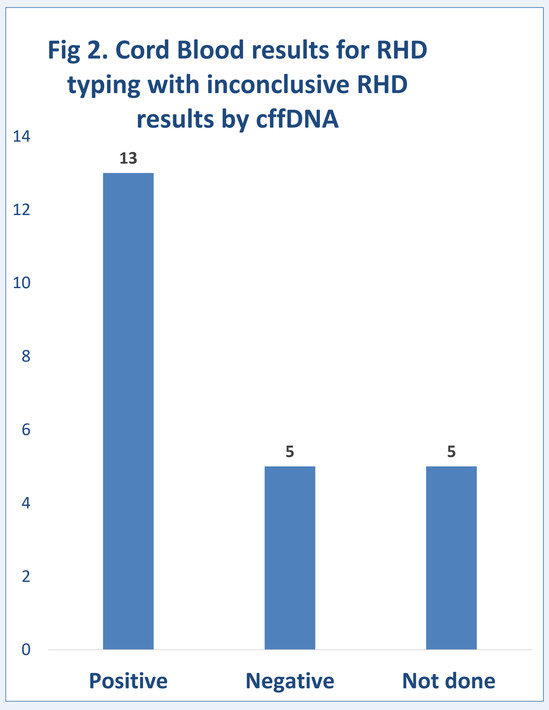
The transfusion laboratory provided the list of RHD negative pregnant women who had blood test sent for cffDNA screening from March 2018 to May 2019. Data was collected from Sunquest ICE and Winpath.

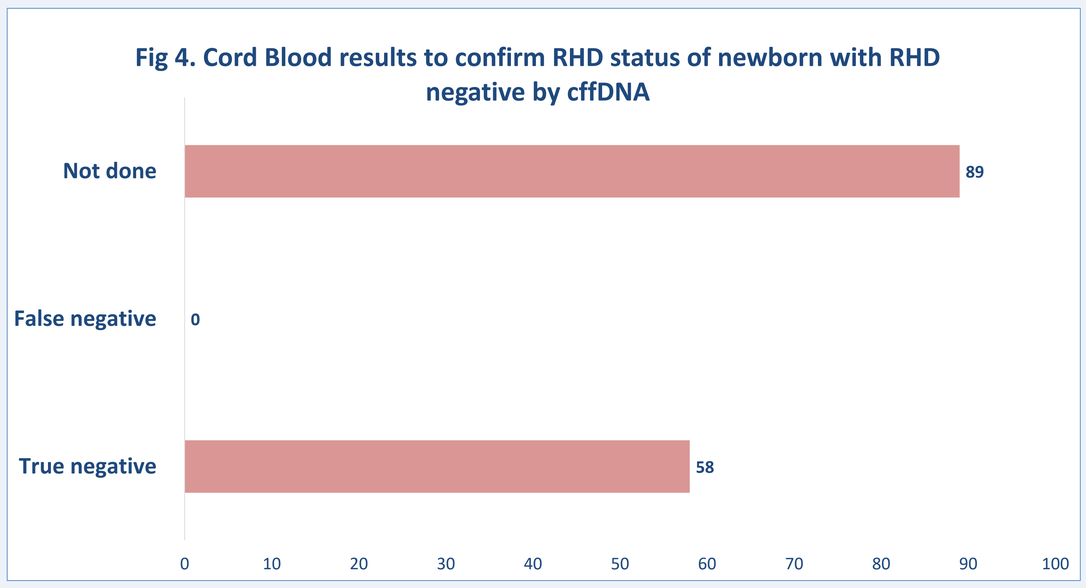
Results

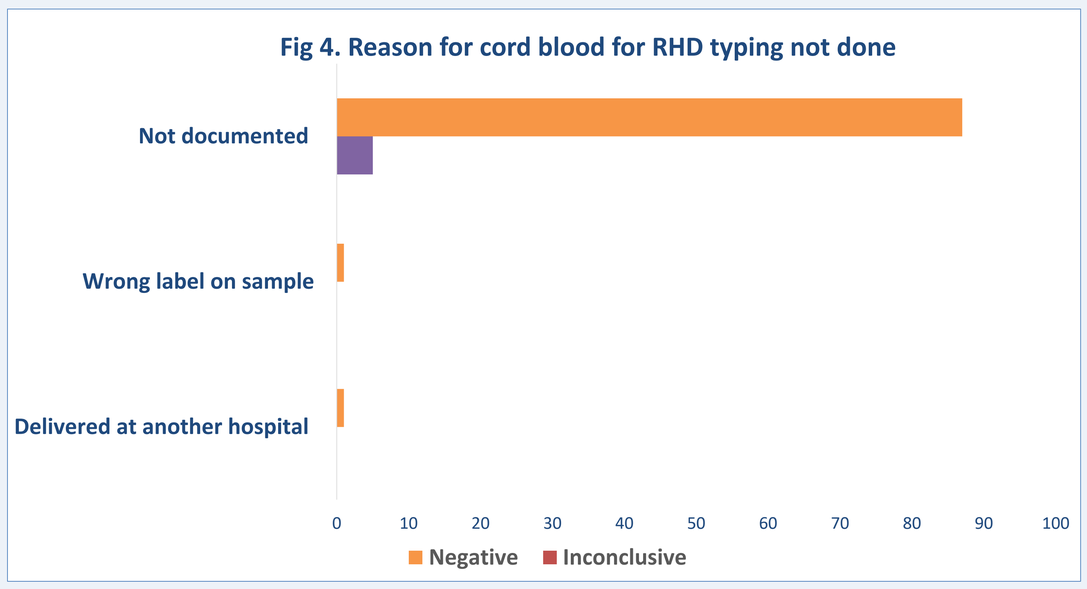
A total of 434 RHD negative pregnant women were identified. Of these pregnant women, 264 (60.8%) were identified to be carrying RHD positive fetuses, 147 (33.8%) were identified to be carrying RHD negative fetuses and 23(5.2%) had inconclusive RHD status by cffDNA screen. There were no false positive or false negative result during the period of the data collection.

Cord blood at delivery for RHD typing was done in 39.4 %(n=58) of pregnant women with a RHD negative fetus according to cffDNA screen. A significant number of pregnant women in this group, 60.5% (n=89) did not have a record of cord blood for RHD typing at delivery. Of the 23 pregnant women with inconclusive RHD status by cffDNA screen, cord blood at delivery for RHD typing identified 56.5%(n=13) were RHD positive, 21.7%(n=5) were RHD negative and 21.7%(n=5) did not have a record of cord blood for RhD typing at delivery. 15.9 %(n=42) of pregnant women with RHD positive fetus by cffDNA screen did not have a record of cord blood for RHD typing at delivery. There were no sensitising events during the period of data collection.









Conclusions

We demonstrated that the cffDNA screen for RHD status not only provides an economic benefit by reducing use of anti-D immunoglobulin, but also demonstrates the added benefit of preventing exposure to unnecessary blood product.

A significant proportion of RHD negative pregnant women did not have cord blood tested at delivery for RHD typing as per local trust policy. The false negative result has clinical implications hence it is important to check RHD status on cord blood at delivery. If unexpected RHD positive result is noted on cord blood at delivery, Anti D immunoglobulin should be given and Kleihauer should be done. Any discrepancies in cffDNA and cord blood for RHD typing should be reported as per local hospital policy and to IBGRL.

Recommendation

We have recommended the obstetric team to ensure cord blood is sent for RHD typing at delivery for RHD negative pregnancies by cffDNA genotyping. We aim to re-audit in 12 months time.

References

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2. High-throughput non-invasive prenatal testing for fetal RHD genotype, 2016 (https://www.nice.org.uk/guidance/dg25)

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