Administration of Routine Antenatal Anti-D Prophylaxis (RAADP) in Wellington, Aotearoa: is our practice equitable?

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ABSTRACT

AIM: To assess local compliance with Routine Antenatal Anti-D Prophylaxis (RAADP) guidelines and to determine if its administration is equitable in Wellington, Aotearoa New Zealand.

METHODS: A retrospective 6-month audit of people birthing in Wellington maternity units. Rhesus-negative people were identified and electronic heath records reviewed.

RESULTS: Two hundred and nine out of 1,881 (11%) of people birthing were Rhesus-negative. Two hundred and five people were included in the audit. Three people were excluded as they birthed prior to 28 weeks, and one was already isoimmunised. One became isoimmunised during pregnancy. Eighty-three out of 205 (40%) received RAADP as per guidelines. Factors that made it more likely for people to receive RAADP were private obstetrician care (78% versus 34%, $p<0.01$), living closer to hospital ($p<0.01$) and birthing in Wellington Hospital (43% versus 11% in a primary unit, $p<0.01$). There is no evidence that management was influenced by ethnicity, mode of birth, parity, age or attendance at a hospital antenatal clinic.

CONCLUSION: RAADP guidelines are not being followed and some subgroups are disproportionately affected. There is evidence of harm, with one person becoming isoimmunised during pregnancy. Simplifying local protocols, establishing more sites for RAADP administration such as pharmacies or primary units and improving staff and patient education could help to address these inequities.

Pregnant people who have a Rhesus-negative blood type are at risk of developing antibodies against Rhesus-positive foetal red blood cells (sensitisation), if there is crossover of foetal cells into the maternal circulation. This can result in a condition called haemolytic disease of the newborn (HDN), causing symptoms ranging in severity from foetal anaemia to hydrops foetalis, stillbirth or neonatal death.[1] This can affect the baby in the current pregnancy or in future pregnancies. Provision of Anti-D for Rhesus-negative people both during sensitising events in pregnancies (such as terminations, amniocentesis or abdominal trauma) and, postnatally, significantly reduces the risk of sensitisation and subsequent effects on the baby.[1]

Routine Antenatal Anti-D Prophylaxis (RAADP) is now internationally recommended to protect from potential silent sensitising events. The Royal Australian and New Zealand College of Obstetricians and Gynaecologists (RANZCOG) and New Zealand Blood Service (NZBS) guidelines have recommended RAADP be given at 28 and 34 weeks gestation since 2016.[2,3] This further reduces sensitisation from 1% to 0.3%.[4] Capital and Coast District Health Board (CCDHB) has recommended RAADP since August 2018, although the policy also notes that RAADP is not yet given routinely across Aotearoa New Zealand.[5] Wellington Hospital has run a dedicated Anti-D clinic since April 2020 where lead maternity carers (LMCs) can refer pregnant people for RAADP. RAADP can also be administered in general antenatal clinics. Written information should be given to the pregnant person to supplement the recommendation of RAADP given by their LMC, with pamphlets provided by the NZBS. Anecdotally, however, RAADP administration is variable across the Wellington Region.

Methods

All people who birthed between 1 January 2021 and 30 June 2021 at CCDHB birthing units were retrospectively identified through the Perinatal Information Management System (PIMS). Medical App Portal (MAP) was used to confirm Rhesus status. People were excluded

from analysis if they were already known to be isoimmunised (i.e., had already developed Anti-D antibodies) or if they birthed prior to 28 weeks gestation. The NZBS provided data linked by NHI for Anti-D doses administered to our cohort anywhere in Aotearoa and all sensitising, RAADP and postnatal doses of Anti-D were evaluated.

For each Rhesus-negative pregnant person, information was obtained from MAP and PIMS on maternal age, parity, ethnicity, address of residence, attendance at a hospital secondary antenatal clinic, type of LMC, midwife or private obstetrician, and whether they birthed in a secondary hospital or a primary birthing unit. Distance lived from hospital was calculated using their address of residence and Google Maps. Each of these factors were analysed in the context of whether RAADP was given as per guidelines or if guidelines were not met. Given as per guidelines was classed as either one double dose of 1250IU, or two 625IU doses at approximately 28 and 34 weeks. A single dose of 625IU or no RAADP was classed as guidelines not being met.

Data were entered into Microsoft Excel Version 16.61.1. In order to assess for a relationship between each LMC type, ethnicity, place of birth and antenatal clinic attendance and whether or not RAADP was administered as per guidelines, Chi-squared independence tests were used, with a p-value of <0.05 used to indicate statistical significance. Independent sample t-Tests (equal variance not assumed) were used to compare age and parity with administration of RAADP, with $p<0.05$ regarded as significant. A Mann–Whitney U test was used to compare distance from hospital with adherence to Anti-D guidelines, as these data were skewed.

Approval for the audit was obtained from the CCDHB Women's Health Service Audit Committee. Ethics approval was not required as this project was classed as a clinical audit.

Results

During the 6-month period, 1,881 people birthed at CCDHB maternity units. Of these, 209 were Rhesus negative. Two hundred and five people were included in the audit. Three people were excluded from our analysis as they birthed prior to 28 weeks and one person was excluded as they were already isoimmunised.

Only 40% (83/205) of Rhesus-negative people received RAADP as per RANZCOG and NZBS guidelines. Postnatal Anti-D was indicated for 136 people in our cohort as their baby was Rhesus positive and 133 (98%) received it.

One person in the cohort was identified as having become sensitised in their third trimester, as there was evidence of passive transmission of antibodies to their baby. They had not received any RAADP.

Tables 1 and 2 show patient characteristics and the associated proportion of RAADP administration.

Statistical significance was not reached when comparing proportions of RAADP administration by age, parity, ethnicity or attendance at a doctor-led hospital antenatal clinic.

There were higher numbers of RAADP given to people under the care of a private obstetrician, compared to those under the care of a midwife (78% versus 34%, $p<0.01$). People who birthed at a secondary hospital were more likely to receive RAADP as per guidelines than those who birthed at a primary maternity unit (43% versus 11%, $p<0.01$). Pregnant people who lived further from hospital were less likely to receive RAADP as per guidelines ($p<0.01$).

Discussion

This audit has identified that RAADP for Rhesus-negative pregnant people in the Wellington Region is not being administered as recommended by national guidelines. There is evidence of harm, with one person becoming isoimmunised during their pregnancy. The administration of RAADP is inequitable by type of maternity carer, place of giving birth and geographical location, with people living further from hospital having significantly lower rates of RAADP prophylaxis.

No statistically significant differences in administration of RAADP were identified by ethnicity. However, as rates of Rhesus negativity are lower in Māori, Pasifika and Asian people, it is likely that the sample size was not sufficiently powered to detect any differences that may exist.

A limitation of the audit was that we were unable to obtain data of people who birthed at home. In 2020, 4% of CCDHB parturients birthed at home.[6] A strength is that we have been able to identify Rhesus status in 100% of our cohort and were able to link these people to all Anti-D doses administered anywhere in Aotearoa.

While we have not addressed the reasons for low rates of RAADP provision, possible reasons include lack of clinician awareness of policies, insufficient capacity at the Anti-D clinic, difficulty accessing the clinic due to lack of transport or parking, inability to access Anti-D at satellite maternity

Table 1: Patient factors and associated adherence to RAADP guidelines.

Variable	Number (%total)	RAADP administered as per guidelines (%)	
Ethnicity			
Māori	16 (8%)	3 (19%)	
NZ European	170 (83%)	70 (41%)	
Asian	13 (6%)	6 (46%)	
Other (Pasifika, Latin American, Middle Eastern, African)	6 (3%)	4 (67%)	*p=0.17*
Lead maternity carer			
Private obstetrician	32 (16%)	25 (78%)	
Midwife (independent and hospital midwives)	173 (84%)	58 (34%)	*p<0.01*
Place of birth			
Secondary hospital	187 (91%)	81 (43%)	
Primary birthing unit	18 (9%)	2 (11%)	*p<0.01*
Attendance at hospital antenatal clinic (*n=32 excluded as under private obstetrician)			
Attended secondary clinic	82	33 (40%)	
Did not attend secondary clinic	91	40 (44%)	*p=0.62*

Table 2: Patient factors and associated adherence to RAADP guidelines.

Variable	RAADP administered as per guidelines	RAADP not administered as per guidelines	
N	**83**	**122**	
Age (years) M±SD	33.2 ±3.9	32.5 ± 5.1	p=0.33*
Parity M±SD	0.5±0.8	0.7±0.6	p=0.12*
Distance lived from hospital (km) Mdn, (IQR)	13.5 (22.3)	24.8 (IQR 38.25)	p<0.01 **

*t-Test
**Mann–Whitney U test

units, clinicians not recommending RAADP or patients declining. As we had no access to independent midwifery or private obstetrician notes, we were unable to assess if there was a clinical reason for people not requiring RAADP, such as the partner known to be Rhesus negative and paternity certain. With such successful uptake of Anti-D administration postnatally (98%), it appears that patients find administration of Anti-D acceptable, though the reason for the discrepancy between antenatal and postnatal uptake is unknown. It is likely that barriers to RAADP are not unique to CCDHB and are present in other regions of Aotearoa. Rurality has previously been identified as a likely barrier to RAADP, with a study showing that fewer than one in five women received any antenatal Anti-D in Southland, New Zealand.[7] Badami et al. found that the rates of sensitisation in Christchurch are three times higher than would be expected if RAADP was given as per guidelines, and this is likely due to poor adherence to local guidelines for RAADP.[8]

In order to facilitate implementation of changes to practice, the barriers to the administration of RAADP to all eligible people need to be identified. Once further information around these barriers has been identified, initiatives can be put in place to improve RAADP rates.

Currently, for pregnant people to access the local Anti-D clinic, a referral is required from their LMC. An automatic digital referral to an Anti-D clinic at booking, once Rhesus status is determined from early antenatal blood tests, would reduce the need for LMCs to independently refer to the clinic and may improve administration rates. Those who decline RAADP after appropriate counselling could opt out of the clinic rather than opting in.

Accessibility is also a barrier, with people who live further from hospital having lower rates of RAADP—therefore, the development of more Anti-D clinics at satellite locations may improve this. Accessibility has been addressed uniquely in other regions of New Zealand, including by Counties Manukau District Health Board who have introduced an initiative whereby pharmacists can administer Anti-D to their Rhesus-negative population free of charge, in an effort to improve access to care and reduce the traffic of patients into hospital.[9]

Concerningly, 60% of Rhesus-negative pregnant people attending a secondary antenatal clinic at the hospital did not receive RAADP as per the guidelines, despite having face-to-face interactions with a clinic midwife and an obstetric doctor. Factors that could have contributed to this include people being seen at variable gestations outside of recommended RAADP administration, a broad range of experience among clinic doctors and the absence of a central documentation system that is accessible by both the hospital team and private or independent LMCs. Regardless of cause, this rate of administration needs to improve. A complete electronic record of all perinatal care, such as BadgerNet with integrated alerts for Rhesus status and when Anti-D is due, has the potential to improve uptake in this population.

The current CCDHB protocol for Anti-D gives the options of two doses of 625IU of Anti-D or a single dose of 1250IU. Consideration of recommending a single dose of 1250IU could improve uptake as it reduces the number of visits required and would therefore increase capacity of the current Anti-D clinic. There is some evidence that a single dose of Anti-D prophylaxis is not as effective as 2 doses.[10] However, it is associated with higher compliance, lower cost and greater convenience in overseas jurisdictions.[11] Given that only 40% of pregnant people are currently receiving RAADP in CCDHB, it could be argued that there would be greater overall population benefit to having larger numbers of people receiving a single dose.

This audit has demonstrated significant deficiencies in the administration of RAADP within the CCDHB population, with evidence of harm in the development of isoimmunisation. There is inequity with people living closer to hospital, or people under the care of a private obstetrician, being more likely to have been administered RAADP. While this study has been undertaken at CCDHB, it is feasible that this deficiency is reflected in other district health boards. These inequities need to be urgently addressed to provide high-quality maternity care for all pregnant people.

As a result of this audit, a multitude of changes were made to improve uptake of RAADP in this population. The RAADP policy was simplified to give only two dose options—single doses at 28 and 34 weeks or a one-off double dose around 32 weeks. Providers (doctors and midwives, both public and private) were re-oriented to the policy with the changes outlined. In addition, a second Anti-D clinic was opened in one of the satellite units in October 2022, in an effort to improve accessibility for this population. Re-auditing this process will be essential in determining if these changes do improve rates of RAADP administration in the region.

COMPETING INTERESTS
The authors of this article have no competing interests to declare.

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