2019 Annual SHOT Report – Supplementary information

Chapter 24: Anti-D immunisation in pregnancy

No previous pregnancy (NPP) n=17

There were 17 new cases in 2019 (no cases excluded), cumulative to date 83 cases**.**

Summary of 2019 NPP data

Whilst in the majority of NPP cases, alloimmune anti-D is detected at delivery, there has been an increase in cases detected prior to 28 weeks in this year's dataset, although causes remain unclear.

Booking weights data was missing in half the cases reported, which is unfortunate and maybe due to difficulty accessing handheld records and failure to record booking information in hospital records. We would encourage reporters to try and obtain this data as it is important in providing evidence for the role of obesity as a risk factor for immunisation.

In 12/15 cases where the information was available, RAADP was received between 28-30 weeks. 3 women did not receive RADDP, one pregnancy resulted in intrauterine death at 27 weeks gestation, unlikely to be related to alloimmune anti-D. The 2 remaining pregnancies received no antenatal care, and alloimmune anti-D was detected in both cases at delivery, quantification results were 4 and 83.9IU/mL and both neonates required treatment.

The 2018 SHOT Annual Report was the first to include data relating to cffDNA in 2/8 NPP cases, in 2019 only 1/17 NPP cases reported use of cffDNA testing.

There were 4 cases of potential sensitising events. Three, in separate pregnancies, were due to a fall or abdominal trauma. In 1 of the 3 cases the FMH estimation was not provided, so it is not possible to determine that the 500IU dose of anti-D Ig provided in this case was adequate. Alloimmune anti-D was subsequently identified at 28 weeks. The 4th case was an antepartum haemorrhage at 12^{+3}, no anti-D Ig was offered and alloimmune anti-D was subsequently identified at 27 weeks.

The British Society for Haematology (BSH) guideline on the use of anti-D Ig for the prevention of HDFN (BSH Qureshi et al. 2014) current recommendation is 'anti-D prophylaxis is indicated in cases of uterine bleeding where this is repeated, heavy or associated with abdominal pain', even when gestation is less than 12 weeks. However the National Institute for Health and Care Excellence (NICE) guideline 126 (NICE 2019a) covers diagnosing and managing ectopic pregnancy and miscarriage in women with complications, such as pain and bleeding, in early pregnancy (that is, up to 13 completed weeks of pregnancy) and whilst the recommendation is to 'Offer anti-D rhesus prophylaxis… to all rhesus-negative women who have a surgical procedure to manage an ectopic pregnancy or a miscarriage', the guideline also recommends 'Do not offer anti-D rhesus prophylaxis to women who receive solely medical management for an ectopic pregnancy or miscarriage or have a threatened miscarriage or have a complete miscarriage….. 'As such this would support not offering anti-D Ig in the 4th case at 12^{+3}. The BSH anti-D guideline

update 03 February 2020 highlights the more recent NICE guidance should be referred to in relation to ectopic pregnancy and miscarriage and abortion care pending an update to the BSH guidelines.

Two of these cases of potential APH were treated in accordance with BSH guideline and 1 in accordance with NICE guidelines, only 1 case appropriately omitted the FMH estimation. However, all 4 resulted in sensitisation which may impact upon future pregnancies. Hence ideal management may not prevent sensitisation.

In 3 cases alloimmune anti-D was first detected at 40 weeks, 2 of which were at delivery, the third case delivered at 42 weeks, all these had RAADP, no PSE and none of were obese.

With regards to outcome, 16 pregnancies resulted in a live birth, 7 babies required treatment for HDFN. Cumulatively, 82 pregnancies have resulted in a live birth, 1 intrauterine death. 31/82 (37.8%) neonates required treatment for HDFN, 22 phototherapy and 9 exchange transfusion. There was one intrauterine death this year, detected at 27 weeks gestation, and unlikely to be due to HDFN.

Numerical data

When was the alloimmune anti-D detected?

Whilst cumulative data shows that in the majority of cases immune anti-D is first detected at delivery there has been an increase in the proportion of cases detected prior to 28 weeks.

Table 24.1: Time of detection of alloimmune anti-D

	Number of new cases 2019	Number of cases cumulative to 2019
Before 28 weeks	5	11
At or after 28 weeks, before delivery	7	26
At delivery	4	43
Other	0	1*
No information	1	2
Total	**17**	**83**

**Alloimmune anti-D was detected 6 months postpartum after large FMH of 12.7mL at delivery managed correctly*

What was the booking weight?

Weight is used in place of body mass index (BMI) as weight is more fully reported than BMI. Using average female height in the United Kingdom (UK), 80kg would equate to obesity in most women.

Table 24.2: Booking weight

Weight at booking in kg	Number of new cases 2019	Number of cases cumulative to 2019
<68	5	37
68-80	3	8
>80 (obese)	1	11
No information	8	27
Total	**17**	**83**

Did the women receive appropriate RAADP?

Of the cases where data was available (n=15) 12 received RAADP between 28-30 weeks, 3 omitted RADDP. One pregnancy resulted in intrauterine death at 27 weeks gestation, no PSE identified prior to or during pregnancy prior to the detection of the intrauterine death. The 2 remaining pregnancies received no antenatal care, alloimmune anti-D was detected in both cases at delivery, quantification results were 4IU/ml and 83.9IU/ml and both neonates required treatment.

Table 24.3: Details of RAADP for eligible cases

RAADP regimen	Number of new cases 2019	Number of cases cumulative to 2019
Single dose 1500IU at 28-30 weeks	12	62
Two dose regimen 500IU	0	1
Not given	3*	14
Unknown	2	2
Total eligible cases	**17**	**77**

**Alloimmune anti-D detected before RAADP due in 1 case (IUD); 1 late booking at 36 weeks and 1 case received no antenatal care*

The route was intramuscular (IM) in all cases, in 4 cases deltoid was specified.

cffDNA testing

Table 24.4: cffDNA testing

cffDNA test	Number of cases 2019	Details
Not performed	14	10 commented cffDNA not available or routinely performed 1 case the woman did not consent 1 case unrecognised pregnancy 1 case unknown 1 case commented no antibodies detected at booking, sensitisation detected on admission in labour
Performed	1	1 result inconclusive (performed at 9 weeks gestation)
No information	2	
Total	**17**	

In the 1 case where routine high-throughput NIPT was performed, this was at 9 weeks and the result was inconclusive. A National Institute for Health Research (NIHR) funded multi-centre study investigated test sensitivity at different gestational ages and concluded that the test is reliable from 11^{+2} weeks gestation (Chitty et al. 2014). Where an organisation has implemented screening this should be performed from 11^{+2} weeks gestation.

Details of potentially sensitising events (PSE)

There were 4 cases of potential sensitising events. Three were due to a fall or abdominal trauma in 3 separate pregnancies. In 1 of the 3 cases the fetal maternal haemorrhage (FMH) estimation was not provided so it is not possible to determine that the 500iu dose of anti D Ig provided in this case was adequate. Alloimmune anti D was subsequently identified at 28 weeks. The 4^{th} case was an antepartum haemorrhage at 12^{+3}, no anti D was offered, alloimmune anti D was subsequently identified at 27 weeks.

2 of these cases were treated in accordance with British Society for Haematology guideline (BSH Qureshi et al. 2014) and 1 in accordance with the National Institute for Health and Care Excellence (NICE) guideline (NICE 2019a), only 1 case where appropriate was the fetal maternal haemorrhage estimation omitted. However, all 4 resulted in sensitisation which may impact upon future pregnancies, suggesting that "ideal" management in accordance with current guidelines may not prevent sensitisation.

Table 24.5: Details of potentially sensitising events

Number of PSE	Details	Management
4 cases had PSE reported	3 cases fall/abdominal trauma 20, 25 and 31 weeks gestation	2 of the 3 cases at or after 20 weeks had FMH estimation by Kleihauer test, both estimated to be <2mL. In 1 case testing for FMH was omitted All 3 received anti-D Ig: 500IU, 1500IU and 1500IU respectively within 24 hours
	1 case antepartum haemorrhage/ PV bleeding 12^{+3} weeks gestation	No anti-D Ig was offered
11 cases	No PSE reported	
2 cases	No information given	

Pregnancy outcomes in NPP case

In 2019 the pregnancy outcome was reported in all 17 cases. There were 16 that resulted in a live birth, and 1 intrauterine death. The intrauterine death was detected at 27 weeks gestation, alloimmune anti-D was detected at this time, the quantification was 0.1IU/mL, so it is unlikely this contributed to fetal demise. In 3 cases alloimmune anti-D was detected at 40 weeks.

With regards to neonatal intervention for haemolytic disease of the fetus and newborn (HDFN), 7 required treatment; 5 received phototherapy alone, 1 received phototherapy and an exchange blood transfusion and 1 received phototherapy, immunoglobulin and an exchange blood transfusion.

Previous pregnancies (PP) n=37

The index pregnancy in these cases refers to the current pregnancy – the pregnancy in which alloimmune anti-D was first detected.

Summary of 2019 PP data

There were 37 new PP cases in 2019, including 10 cases where alloimmune anti-D was found in the first trimester. Review of the cumulative cases identifies 90/233 (38.6%) cases were detected in the first trimester. Where alloimmune anti-D is detected at booking in the index (current) pregnancy, only the events in the preceding pregnancy are relevant to the sensitisation (assuming no other exposure to the D antigen occurred e.g. transfusion, an unlikely event in this demographic). Where anti-D is detected later in the index pregnancy, the relative contribution of events in the previous and index pregnancy is less certain. In 7 cases where alloimmune anti-D was detected for the first time at delivery of index pregnancy, 3 had a gestation of more than 40 weeks. The cumulative data shows that 37 pregnancies where alloimmune anti-D was first detected at delivery in the index pregnancy, 13 cases (35.1%) were delivered after 40 weeks gestation. National Health Service (NHS) maternity statistics 2014-2015 indicate 17.5% pregnancies extended beyond 40 weeks. *http://content.digital.nhs.uk/catalogue/PUB19127* .

With regards to the data of the pregnancy preceding the index pregnancy, there were 33 live births, 2 terminations and 2 first trimester miscarriages. Cumulatively, of the 109 women where booking weight was provided, 29 (26.6%) were obese. National data (Public Health England 2018) report 19% incidence of obesity in pregnant women in the United Kingdom (UK).

The RAADP data in preceding pregnancies suggests a developed, embedded process, with the majority receiving appropriate RAADP where reported.

In keeping with the NPP cases very few preceding pregnancy cases report cffDNA testing.

There were 7 PSE in preceding pregnancies; 5 appropriately managed, 1 failure to provide anti-D Ig and no FMH test at 35 weeks gestation, and 1 case where limited data was available to review the management. Since 2013 however only 39 of 60 PSE reported in preceding pregnancies were managed appropriately, evidencing the need to continue to audit the anti-D pathway and provide ongoing education and tools to support best practice.

Four of the preceding pregnancies delivered beyond 40 weeks gestation. Cumulatively (data collected from 2015 onwards), 34/161 (21.1%) preceding pregnancies lasted longer than 40 weeks. NHS maternity statistics 2014-2015 indicate 17.5% pregnancies extended beyond 40 weeks. *http://content.digital.nhs.uk/catalogue/PUB19127.*

In 6/33 (18.2%) preceding pregnancies the postpartum FMH was more than 4mL, the background rate of postpartum FMH >4mL is 1%, which is consistent with the likelihood of an increased risk of sensitisation following a large FMH.

Where alloimmune anti-D was identified in the first trimester in the index case (n=10), review of the preceding pregnancies highlights cases where ‘ideal ’management with no risk factors still resulted in immunisation. However, 4 of the cases delivered beyond 40 weeks, 3 of the cases had a large FMH and in 1 case, there was a delay in postpartum prophylaxis following home delivery. One of the large FMH cases appeared to have received ideal management, 1 case omits detail of whether a further dose of anti-D Ig was administered for a follow up FMH of 2mL and 2 cases did not

complete a further FMH test to confirm clearance of the total FMH. The current guideline recommends repeating the FMH test until fetal cells are cleared.

There were 27 cases of immune anti-D detected beyond the first trimester. Cumulatively, 26/134 women who developed anti-D in the index pregnancy beyond the first trimester were clinically obese, and in 102 women where booking weight was provided, 26 (25.5%) were obese. National data (Public Health England 2018) report 19% incidence of obesity in pregnant women in the UK. These data support the continued review of cases to further determine if women who are obese require additional anti-D Ig

In keeping with the data from NPP cases and PP cases where alloimmune anti-D was detected in the first trimester; reported use of cffDNA testing is limited.

Five out of the 6 PSE prior to detection of immune anti-D beyond the first trimester were managed appropriately, again highlighting cases where 'ideal 'management with no risk factors still resulted in immunisation.

Of the 37 PP cases there were 33 live births, 1 still birth and 1 first trimester loss, outcome data is missing for 2 cases. Interventions were required in 17 cases, intervention data is missing in 2 cases. Interventions ranged from phototherapy to immunoglobulin, exchange blood transfusion and intrauterine transfusion.

Numerical data

When was alloimmune anti-D detected in index (current) pregnancy?

Table 24.6: When alloimmune anti-D was detected

Time of anti-D detection	Number of new cases 2019	Number of cases cumulative to 2019
At booking (if first trimester)	10	90
After booking to 28 weeks (includes late booking)	7	24
At or after 28 weeks	13	73
At delivery	7	37
Other	0	9*
Total	**37**	**233**

***** *2 preoperative assessment following pregnancy, 3 at planned follow up of large FMH at delivery where correct dose of anti-D Ig had been given, 3 unknown, 1 non pregnant*

Where alloimmune anti-D was detected at booking in the index (current) pregnancy, only the events in the preceding pregnancy are relevant to the sensitisation (assuming no other exposure to the D antigen occurred e.g. transfusion, an unlikely event in healthy fertile women). Where anti-D is detected later in the index pregnancy, the relative contribution of events in the previous and index pregnancy is less certain.

In the 7 women who had alloimmune anti-D detected for the first time at delivery of index pregnancy, 3 had gestation of more than 40 weeks (40^{+2}, 40^{+6}, 41).

The cumulative data show that of 37 pregnancies where alloimmune anti-D was first detected at delivery in the index pregnancy, 13 cases (35.1%) were delivered after 40 weeks gestation.

Information about the pregnancy immediately preceding index (current) pregnancy

Table 24.7: Outcome of the preceding pregnancy

Outcome of preceding pregnancy	Number	Details
Live birth	33	• 22 D-positive neonates • 3 D-negative neonates • 6 D-type not provided • 2 data missing
Other	4	• 1 medical termination of pregnancy at 6 weeks, received 500iu anti-D Ig, weight 68.2, BMI 27 • 1 termination (TOP) 15^{+2} no detail provided • 1 miscarriage at 5-6 weeks, no anti-D Ig, weight 97kg, BMI 32 • 1 miscarriage at less than 8 weeks, no anti-D Ig

What was the booking weight of preceding pregnancy? (includes only cases where previous pregnancy resulted in live birth)

Table 24.8: Booking weight of preceding pregnancy

Weight at booking in kg	Number of new cases 2019	Number of cases cumulative to 2019
<68	8	62
68-80	24	18
>80 (obese)	1	29
No information	22	96
Total	**33**	**205**

2 TOP and 2 miscarriages not included

Cumulatively, of the 109 women where booking weight was provided, 29 (26.6%) were obese. National data (Public Health England 2018) report 19% incidence of obesity in pregnant women in the UK.

RAADP in preceding pregnancy (for women who carried to a live birth in preceding pregnancy)

Table 24.9: Details of RAADP in preceding pregnancy

RAADP	Number of new cases 2019	Number of cases cumulative to 2019
Single dose	22	126
Two doses	0	10
Given (no details on dose)	2	2
Not given	2*	25**
No information	7	42
Total	**33**	**205**

2 TOP and 2 miscarriages not included
1 case refused, 1 case no reason provided
***Reasons include: learning difficulties, concealed pregnancy, needle phobic, prior to RAADP introduction, delivered abroad, declined, typed incorrectly, midwife error, typed incorrectly as D-positive.*

In 11 cases the route was specified as deltoid, no cases were given anti-D Ig intravenously.

Details of cffDNA testing in preceding pregnancy (for women who carried to a live birth in preceding pregnancy)

As with the NPP cases, very few cases report cffDNA testing. In 3 preceding pregnancies cffDNA testing was performed and predicted the fetus in each case to be D-positive.

Table 24.10: cffDNA preceding pregnancy

cffDNA test	Number of new cases 2019	Details
Not performed	20	16 cffDNA not available or routinely performed 1 case the woman did not consent 1 case unrecognised pregnancy 1 case reason unknown (1 TOP) 1 case commented no antibodies detected at booking, sensitisation detected on admission in labour
Performed	3	Predicted D positive fetus (test performed at 16,16,17 weeks gestation)
No information	11	9 missing data 2 previous pregnancy details unknown
Total	**34**	

1 TOP and 2 miscarriages not included

Details of PSE in preceding pregnancy reported in 2019

Table 24.11: Details of PSE

Number of PSE	Details
7 PSE reported	**Appropriate management** • 1 medical termination of pregnancy at 6 weeks, received 500IU anti-D Ig* • 1 miscarriage at 5-6 weeks, no anti-D Ig • 1 miscarriage at less than 8 weeks, no anti-D Ig. • Amniocentesis; chorionic villus sampling at 13 weeks gestation, received 1500IU anti-D Ig • Antepartum haemorrhage/PV bleeding at 16 weeks gestation, received 1500IU anti-D Ig **Error in management** • PV spotting at 35 weeks gestation, no additional prophylactic anti-D Ig offered and no FMH estimation **Inconclusive management** • 1 termination of pregnancy at 15^{+2}, no further detail provided
20 cases had no PSE reported	
10 cases had no information on PSE	

**Appropriate in accordance with BSH guideline, not concordant with NICE 126 (NICE 2019a)*

Since reporting began in 2013, a total of 60 PSE have been reported in the preceding pregnancies of which 39 (65.0%) were managed correctly.

Method of delivery of preceding pregnancy

Table 24.12: Delivery details

Type	Number of new cases 2019	Number of cases cumulative to 2019
No information	5	52
Vaginal	19	93
Instrumental	2	10
Elective caesarean section (El CS)	3	20
Emergency CS (Em CS)	4	30
Total	**33**	**205**

2 TOP and 2 miscarriages not included

Gestation at delivery of preceding pregnancy

Table 24.13: Gestation at delivery of preceding pregnancy

Gestation at delivery (weeks)	Number of new cases 2019
40 weeks or less	25
More than 40 weeks	4
No information	4
Total	**33**

2 TOP and 2 miscarriages not included

Cumulatively (data collected from 2015 onwards), 34 out of 161 previous pregnancies (21.1%) lasted longer than 40 weeks. NHS maternity statistics 2014-2015 indicate 17.5% pregnancies extended beyond 40 weeks. *http://content.digital.nhs.uk/catalogue/PUB19127*

Postpartum management in preceding pregnancy

Table 24.14a: Test for postpartum FMH

FMH test performed postpartum	Kleihauer test (K)	Flow cytometry (F)	K+F	Method not specified	No	Notes on cases where FMH test not done	Unknown
19	13	0	6	0	**4**	1 case refused 3 D-negative neonates	**6**

2 TOP and 2 miscarriages not included

Table 24.14b: Postpartum anti-D Ig prophylaxis

What happened?	Number of new cases 2019	Number of cases cumulative to 2019
FMH test and appropriate dose of anti-D Ig	15	120
No prophylaxis	2*	14***
Incorrect dose/timing of anti-D Ig	3	6***
No information	7+3**	50
D-negative baby	3	15
Total	**33**	**205**

2 TOP and 2 miscarriages not included

**Immune anti-D detected at time delivery (2)*
***No consent for FMH test given 500IU (1), not able to determine if correct dose in absence FMH test, no FMH test detail so not able to determine if correct dose in absence FMH (2)*
****Reasons included: typed in error as D-positive, refused, from abroad, learning difficulties, needle phobic, declined, missed anti-D Ig in error, dose 250IU, dose given late*

Anti-D detected at first trimester booking of index pregnancy n=10

The details of the preceding pregnancy may provide information on the cause of immunisation in these cases.

Table 24.14: Details of management in previous pregnancy (- =no information/unknown)

Case	Obese (booking weight >80kg)	RAADP	PSE	Delivery gestation (weeks)	Delivery route	PPP	Risk factors identified
1	No	Yes	No	42^{+3}	Vaginal	D-positive neonate FMH (K)<2mL 1500IU anti-D Ig	Ideal management Delivered 42^{+3} weeks
2	-	-	No	40	-	-	2 prior pregnancies: 1 live birth delivered 40/40 1 miscarriage Insufficient information
3	-	-	No	-	Vaginal	Anti-D Ig given No FMH test or dose detail >72 hours PP (home delivery)	Delayed PPP (home delivery)
4	No	Yes	No	40^{+6}	Emergency CS	FMH (K) <2mL Anti-D Ig 1500IU	Ideal management 1 previous live birth RAADP given appropriately No PSE Delivered 40^{+6} weeks
5	No	Yes	APH/ PV bleeding 16/40 Anti-D Ig1500IU	35^{+6}	Emergency CS	FMH (K/F) 79mL, anti-D Ig 12000 intravenously Follow up FMH 1mL, anti-D Ig 1500IU	Near ideal management Omitted to check FMH cleared PSE, large FMH
6	No	Yes	No	41^{+1}	Instrumental	FMH (K/F) 58mL, Anti-D Ig 8000IU ? administration route FU FMH 2ml No detail further of anti-D Ig doses	1 previous miscarriage 1 previous live birth 41^{+1} Large FMH Detail does not confirm if further dose or if FMH cleared
7	No	Yes	No	40^{+1}	Vaginal	FMH (K/F) 16mL, anti-D Ig 3000IU, FU FMH 0mL	Ideal management 1 previous live birth 40^{+1} Large FMH

8	-	-	Termination 15+2 No detail of procedure or anti-D Ig				No detail if medical or surgical termination or anti-D Ig
9	-	No	Miscarriage 8/40 No anti-D Ig				Ideal management 2 prior miscarriages
10	-	Yes	No	39	Emergency CS	No detail FMH No detail anti-D Ig	1 live birth Limited detail

Gaps in data in these cases make analysis difficult, but as in NPP reports, there are cases where apparently 'ideal' management with no risk factors still resulted in immunisation. 4 of the cases delivered beyond 40 weeks, 3 of the cases had a large FMH in the prior pregnancy and in one case there was a delay in postpartum prophylaxis following a home delivery.

One of the large FMH cases appeared to have received ideal management, 1 case omits detail of whether a further dose of anti-D Ig was administered for a follow up FMH of 2mL and 2 cases did not perform a further FMH test to confirm complete clearance of fetal cells.

Alloimmune anti-D detected after first trimester in index (current) pregnancy n=27

Further information is requested on the index pregnancy when alloimmune anti-D is detected after the booking (first trimester) sample, as it may be that the sensitisation occurred in the index pregnancy rather than in the preceding pregnancy.

What was the booking weight of index pregnancy?

Table 24.16: Booking weight

Weight at booking in kg	Number of new cases 2019	Number of cases cumulative to 2019
<68	3	46
68-80	11	30
>80	6	26
No information	7	32
Total	**27**	**134**

Cumulatively, 26 out of 102 (25.4%) women where booking weight was provided, and who developed alloimmune anti-D in the index pregnancy, were clinically obese. National data (Public Health England 2018) report 19% incidence of obesity in pregnant women in the UK. The higher rate of obesity is consistent with the NPP cases; however further research is required to determine if obesity is truly associated with increased alloimmunisation risk, as has been suggested.

RAADP in index pregnancy

Table 24.17: Details of RAADP

RAADP given or not	Number
Single dose 1500IU	17
Two dose 500IU	1
Not given	9
Alloimmune anti-D present prior to RAADP	*6*
Declined	*1*
Not referred	*1*
Previous allergic reaction	*1*

cffDNA testing

Table 24.18: cffDNA testing

cffDNA test	Number of cases	Details
Not performed	18	13 test not available/ not routinely performed 1 immune anti-D present 1 reason unknown 1 did not attend 1 declined 1 no reason provided
Performed	7	Test performed by international blood group reference laboratory (IBGRL)
No information	2	

In keeping with the data regarding NPP cases and PP cases where alloimmune anti D detected in the first trimester; reported use of cffDNA testing is limited.

Details of potentially sensitising events in index pregnancy

Table 24.19: Details of potentially sensitising events

Number of women	Details
6 cases PSE reported prior to detection alloimmune anti-D	• APH/PV bleeding 13^{+3} weeks, omission anti-D Ig, alloimmune anti-D detected 28/40, neonate required phototherapy • PV bleeding (light) 6 and 8 weeks, initially twin pregnancy, 12-week scan singleton pregnancy remained. Alloimmune anti-D detected 29/40, no neonatal treatment required • APH at 17 weeks,1500IU anti-D Ig given, alloimmune anti-D detected 40 weeks, no neonatal treatment required • Fall or abdominal trauma 25^{+5} weeks, FMH <2mL, 500IU anti-D Ig given, alloimmune anti-D detected 28 weeks • PV bleed at 23^{+4} weeks, FMH <2mL, 1500IU anti-D Ig given, alloimmune anti-D detected 28^{+3} weeks • APH/PV bleeding at 22^{+5} weeks, FMH <2mL, 1500IU anti-D Ig given, alloimmune anti-D detected at 25 weeks
19 cases no PSE reported	

Outcomes of pregnancies reported in 2019

Table 24.20: Outcome of pregnancies reported in 2019

Number of cases	Outcome
33	Live births
1	Miscarriage 8+2 weeks
1	Stillbirth 28+1
2	Outcome data missing
17	No treatment
11	Required phototherapy
2	Required phototherapy and immunoglobulin
1	Required exchange transfusion
1	Required phototherapy and exchange transfusion
1	Required phototherapy, immunoglobulin and exchange transfusion
1	Required intrauterine transfusion and phototherapy
3	Treatment data missing

References

BSH Austin E, Bates S, de Silva M, et al. (2009) Guidelines for the estimation of fetomaternal haemorrhage. http://www.b-s-h.org.uk/media/15705/transfusion-austin-the-estimation-of-fetomaternal-haemorrhage.pdf [accessed 09 June 2020].

BSH Qureshi H, Massey E, Kirwan D, et al. (2014) Guideline for the use of anti-D immunoglobulin for the prevention of haemolytic disease of the fetus and newborn. Transfus Med 2014;24(1):8–20. https://onlinelibrary.wiley.com/doi/epdf/10.1111/tme.12091 [accessed 09 June 2020].

Chitty LS, Finning K, Wade A, et al. (2014) Diagnostic accuracy of routine antenatal determination of fetal RHD status across gestation: population based cohort study *BMJ* 2014;**349**:g5243. https://www.bmj.com/content/349/bmj.g5243 [accessed 09 June 2020].

NICE (2008) Routine antenatal anti-D prophylaxis for women who are rhesus D negative. Technology Appraisal Guidance No. 156. https://www.nice.org.uk/Guidance/TA156 [accessed 08 June 2020].

NICE (2019a) Ectopic pregnancy and miscarriage: diagnosis and initial management. NICE guideline NG126 https://www.nice.org.uk/guidance/ng126/chapter/Recommendations#anti-d-rhesus-prophylaxis [accessed 08 June 2020].

NICE (2019b) Abortion care. NICE guideline NG140. https://www.nice.org.uk/guidance/ng140/chapter/Recommendations#anti-dprophylaxis [accessed 08 June 2020].

NICE (2016) High-throughput non-invasive prenatal testing for fetal RHD genotype. Diagnostics guideline DG25. https://www.nice.org.uk/guidance/dg25/chapter/3-The-diagnostic-tests#.Wmn-IZGy-8E.email [accessed 09 June 2020].