Adverse Events Related to Anti-D Immunoglobulin – Prescription, Administration and Sensitisation

14

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Definition:

An adverse event relating to anti-D immunoglobulin (anti-D Ig) is defined as relating to the prescription, requesting, administration or omission of anti-D Ig which has the potential to cause harm to the mother or fetus immediately or in the future.

DATA SUMMARY
Total number of cases: n=354

Implicated components		Mortality/morbidity	
Red cells	0	Deaths definitely due to transfusion	0
Fresh frozen plasma (FFP)	0	Deaths probably/likely due to transfusion	0
Platelets	0	Deaths possibly due to transfusion	0
Cryoprecipitate	0	Major morbidity	1
Granulocytes	0	Potential for major morbidity (Anti-D or K only)	276
Anti-D Ig	354		
Multiple components	0		
Unknown	0		

Gender		Age		Emergency vs. routine and core hours vs. out of core hours		Where transfusion took place	
Male	0	≥18 years	345	Emergency	0	Emergency Department	0
Female	354	16 years to <18 years	7	Urgent	0	Theatre	1
Not known	0	1 year to <16 years	2	Routine	0	ITU/NNU/HDU/Recovery	0
		>28 days to <1 year	0	Not known	354	Wards	271
		Birth to ≤28 days	0			Delivery Ward	0
		Not known	0	In core hours	0	Postnatal	0
				Out of core hours	0	Medical Assessment Unit	0
				Not known/Not applicable	354	Community	82
						Outpatient/day unit	0
						Hospice	0
						Antenatal Clinic	0
						Other	0
						Unknown	0

(ITU=Intensive therapy unit; NNU=Neonatal unit; HDU=High dependency unit)

A total of 394 case reports involving anti-D immunoglobulin were submitted via the SHOT online reporting database in 2013. Of these 43 were withdrawn because they did not meet the criteria for anti-D reporting, 3 were moved to the new anti-D sensitisation group and 1, where anti-D sensitisation followed solid organ transplant, was moved to unclassifiable complications of transfusion (UCT). In addition, 3 cases were transferred in from the near miss category, and 4 cases from incorrect blood component transfused (IBCT).

The final analysis contains 354 case reports, each involving 1 individual. The reports are broken down into the reporting categories shown in Table 14.1.

Adverse events related to the prescription and administration of anti-D Ig are not required for the European Union (EU) and so are reportable as 'SHOT-only'. Clinical reactions to anti-D Ig are reportable to the Medicines and Healthcare products Regulatory Agency (MHRA) 'Yellow Card' system.

From January 2013 SHOT has been conducting a study to look at women who have produced immune anti-D that is detectable for the first time in the current pregnancy and an analysis of the data collected to the end of December 2013 is included as an appendix to this chapter.

Table 14.1: Reporting categories

Category of adverse event	Number of cases
Omission or late administration of anti-D Ig	277
Inappropriate administration of anti-D Ig	59
to an RhD positive woman	*23*
to a woman with immune anti-D	*21*
erroneously to a mother of an RhD negative infant	*11*
given to the wrong woman	*4*
Wrong dose of anti-D Ig given according to local policy	9
Handling and storage errors related to anti-D Ig	9
Total	**354**

Deaths n=0

There was no reported fetal mortality following the omission or delay in administration of anti-D Ig.

Major morbidity n=1

There was 1 case where a woman developed an immune anti-D following omission of prophylaxis during the current pregnancy.

Potential for major morbidity n=276

In a further 276 cases anti-D Ig was administered more than 72 hours following a potentially sensitising event, or omitted altogether, resulting in the potential for sensitisation of the woman to the RhD antigen. This satisfies the current SHOT definition of potential major morbidity. It is not known whether these events resulted in the production of immune anti-D.

Clinical versus laboratory errors

For the reporting year 2013, 354 events related to anti-D Ig administration are summarised in Table 14.2 below, with a breakdown of the proportion of clinical and laboratory errors that were primarily responsible.

Table 14.2: Staff groups primarily involved in anti-D Ig process failures

Type of event	Cases	Staff primarily involved		
		Nurse/ midwife	Laboratory	Doctor
Omission or late administration of anti-D Ig	**277**	245	20	12
Anti-D Ig given to RhD positive woman	**23**	15	4	4
Anti-D Ig given to woman with immune anti-D	**21**	5	15	1
Anti-D Ig given to mother of RhD negative infant	**11**	1	10	0
Anti-D Ig given to wrong woman	**4**	3	0	1
Wrong dose of anti-D Ig given	**9**	4	4	1
Anti-D Ig handling and storage errors	**9**	7	2	0
Totals	**354**	**280**	**55**	**19**

This year shows a change in the pattern of reports with an increase in clinical cases involving midwives, nurses and doctors accounting for 299/354 (84.5%) (up from 74.4% in 2012) and laboratory cases are reduced accounting for 55/354 (15.5%) (down from 25.6% in 2012) of the total reports related to prescription, requesting and administration of anti-D Ig.

Omission or late administration of anti-D Ig n=277

In 245/277 (88.5%) cases the primary error was made by a nurse or midwife, and in 12/277 (4.3%) cases by a doctor. Nineteen of 277 (6.8%) cases resulted from failures in the hospital laboratory and 1/277 (0.4%) cases from a Blood Service reference laboratory.

The location was in the community for 70 cases, and in a hospital setting for 207:

- 31 (11.2%) cases related to potentially sensitising events at <20 weeks of gestation
- 55 (19.8%) cases related to potentially sensitising events at >20 weeks of gestation
- 96 (34.7%) cases related to failures of routine antenatal Anti-D Ig prophylaxis (RAADP)
- 95 (34.3%) cases related to post-natal administration of anti-D Ig

There is a persistent theme of failure to collect anti-D Ig that has been issued by the laboratory, or where it has been collected it is not administered and is found days or weeks later in maternity refrigerators. All 12 cases involving medical staff were related to poor decision-making about the need for anti-D Ig which was clearly not in line with national guidance.

Case 1: Transcription errors when recording results

The laboratory telephoned results to the clinical area, advising that anti-D Ig was required for a woman who had delivered an RhD positive baby. The post-natal ward staff entered the maternal blood group into the results section for the baby, and the woman was discharged without receiving any anti-D Ig. On follow-up by the laboratory as to why the anti-D Ig had not been collected, the error was realised and it was eventually administered 5 days post delivery.

Case 2: System failure in the laboratory results in late administration of anti-D Ig

Mother and cord samples were sent in a timely manner post delivery. However, the laboratory was reportedly severely understaffed and also had no robust system in place to identify outstanding work, so the tests were not performed until the 72-hour window for administration had passed.

Case 3: System failure in testing and recording maternal blood group

Antenatal booking bloods were rejected by the laboratory because of a labelling error, but the woman was never recalled to have repeat samples taken. It was noted at delivery that she was RhD negative and had received no anti-D Ig prophylaxis during her pregnancy.

Case 4: Poor knowledge of prescribing doctor results in failure to administer anti-D Ig

A woman suffered a faint and fall with abdominal trauma at 34 weeks. She was reviewed by a speciality trainee in obstetrics who incorrectly informed her that as she had received RAADP at 28 weeks, no further anti-D Ig was required until after delivery.

Case 5: Misuse of Kleihauer test results in failure to administer anti-D Ig for a sensitising event

A woman presented with a vaginal bleed at 36/40 but was discharged without prophylactic anti-D Ig. Her midwife had recorded in the notes that as the woman had received RAADP at 28 weeks, and the Kleihauer test was 'negative', there was no need to administer further anti-D Ig.

Case 6: Changing a reference laboratory report results in missed administration of anti-D Ig

A Blood Service reference laboratory reported the presence of anti-C+D in a booking sample, so the woman was not offered anti-D Ig prophylaxis when she underwent an amniocentesis. The report was subsequently updated to say that the woman had anti-G rather than anti-C+D, so should have received anti-D Ig prophylaxis for the invasive procedure.

Learning point

- Where anti-C+D is suspected in an antenatal sample laboratories must perform differential adsorption studies to confirm antibody specificity before issuing a report

Case 7: Woman develops immune anti-D following omission of prophylaxis

A 27 year old woman fainted and fell down stairs at 26/40 gestation. She attended her general practitioner (GP) with abdominal pain, but was not given any anti-D Ig prophylaxis. When she attended antenatal clinic at 30 weeks for her RAADP, she was found by a Blood Service reference laboratory to have anti-D in her group and screen sample. She delivered 2 weeks later, but there are no details of post-natal tests on the baby.

Inappropriate administration of anti-D Ig n=59

This group is further subdivided into four categories.

Anti-D Ig given to RhD positive women n=23

Overall 15/23 (65.2%) errors were made by a nurse or midwife, 4/23 (17.4%) by a doctor, and 4/23 (17.4%) primary errors arose in the laboratory.

The majority, 16/23 (69.6%) cases originated in the hospital setting, with 7 in the community.

Case 8: GP administers anti-D Ig in error to an RhD positive woman

A pregnant woman attended her GP surgery for a routine visit. On the basis of an alleged family history of Rh immunisation, the GP went to another practice next door, requested a dose of anti-D Ig and proceeded to inject the woman without checking her blood grouping results. She was RhD positive.

Case 9: Anti-D Ig administered without checking records

Following an invasive procedure, the clinical fellow stated that he 'believed' the woman was RhD negative and administered anti-D Ig from stock held in the clinical area. The grouping records in her notes clearly showed her to be RhD positive.

Case 10: Merging of patient records leads to incorrect blood group being recorded

During registration, it was noted that there were two women with identical names on the hospital system, and a merge was authorised. The merge overwrote the blood group as RhD negative in the patient record, though they were in fact two different women and one was RhD positive. She received anti-D Ig for a sensitising event before the discrepancy in paper grouping records was noticed.

Anti-D Ig given to women with immune anti-D n=21

Most of these cases, 15/21 (71.4%), resulted from laboratory errors, and 6/21 (28.6%) resulted from a primary clinical error.

- 19/21 occurred in the hospital setting, and 2/21 in the community
- 15/21 cases resulted from failure to check laboratory records or to take note of grouping reports before requesting or issuing anti-D Ig
- 4/21 cases involved an assumption by the laboratory that positive antibody screens were due to residual prophylactic anti-D Ig, even though there was a computer record of one woman having multiple quantitations of immune anti-D

Case 11: Incorrect comment added to laboratory information management system (LIMS)

A woman known to have immune anti-D had a number of quantitations on record during her pregnancy. A biomedical scientist added a comment '? Prophylaxis' in response to a positive antibody screen, and erroneously issued anti-D Ig for a potentially sensitising event.

Case 12: Poor advice from haematologist

A consultant haematologist advised administering anti-D Ig to a woman confirmed to have immune anti-D, following an intrauterine death.

Case 13: Familiarity breeds complacency?

A 31 year old woman was known to have immune anti-D from previous pregnancies. The same midwife who had cared for her in these pregnancies incorrectly issued anti-D Ig from clinical stock in response to a sensitising event.

Anti-D Ig given erroneously to mothers of RhD negative infants n=11

- 10/11 of these errors originated in the laboratory, and 9/11 occurred in the hospital setting
- 3/11 cases involved misinterpretation of cord grouping results before telephoning the ward
- 3/11 involved the cord blood group being manually entered (incorrectly) onto the LIMS
- 2/11 involved issue of anti-D Ig without reference to LIMS results

Case 14: Clinical pressure to issue anti-D Ig

A woman had delivered an RhD negative baby, but persisted in asking the midwives where her anti-D injection was. They did not check results (which had been telephoned by the laboratory and recorded by the ward) but pressurised the duty biomedical scientist (BMS) on more than one occasion to issue anti-D Ig, which he eventually did without reference to the laboratory computer system.

Anti-D Ig given to the wrong woman n=4

These were exclusively clinical errors, involving failure by nurses, midwives or doctors to identify the correct woman, and all 4 cases occurred in the hospital setting.

Case 15: Misidentification in theatre

Anti-D Ig was prescribed for patient A undergoing an invasive procedure but was administered to patient B by a consultant anaesthetist who failed to identify the patient properly.

Case 16: Grouping reports filed in wrong notes

Anti-D Ig had been issued by the laboratory for patient A, but grouping reports from patient B had been filed in patient A's notes, and these reports were used to perform a bedside administration check for the wrong patient.

Wrong dose of anti-D Ig given n=9

All 9 errors occurred in hospital, 5/9 in the clinical area, and 4/9 in the laboratory.

Case 17: Overestimation of transplacental haemorrhage

A BMS interpreted a fetomaternal haemorrhage FMH (Kleihauer) test as showing a transplacental haemorrhage (TPH) of 15mL fetal cells, and the woman was administered 2000 international units (IU) anti-D Ig. On review by a senior BMS, the TPH was actually 0.3mL.

Case 18: Incorrect dose of anti-D Ig used for RAADP

A midwife issued 250IU anti-D Ig from stock held in the clinical area for a woman attending for RAADP at 28 weeks gestation, instead of the 1500IU indicated by hospital policy and national guidelines.

Case 19: Doctor administers inadequate dose of anti-D Ig

A woman presented with an antepartum haemorrhage (APH) at 39 weeks, and a specialty trainee in obstetrics administered 250IU anti-D Ig from stock held in the clinical area instead of the 500IU minimum indicated by guidelines.

Handling and storage errors related to anti-D Ig n=9

The majority, 7/9 (77.8%), of these errors occurred in the clinical area and 2/9 (22.2%) were laboratory errors. Eight errors occurred within a hospital, and 1 in the community.

- In 2/9 (22.2%) cases expired anti-D Ig was issued from stock held in the clinical area
- In 3/9 (33.3%) cases anti-D Ig was issued from clinical stock held in a ward refrigerator that had been out of temperature control for 10 days

Case 20: Expired anti-D Ig administered in the community setting

Anti-D Ig that had expired two months earlier was administered by community midwives from stock held at the GP clinic.

Near miss anti-D Ig cases n=35

The near miss cases related to administration of anti-D Ig prophylaxis have been sub-categorised showing the point in the process where the error was made.

Table 14.3: Near misses that could have led to errors related to anti-D Ig n=35

Point in the process	Type of error made	Number of cases	Percentage of cases
Request	Requested for RhD positive woman	7	28.5%
	Wrong volume requested	2	
	Not requested	1	
Sample receipt	Failure to notice request for RhD positive woman	3	8.50%
Testing	Misinterpretation	1	11.6%
	Incomplete testing prior to issue	1	
	Manual group error	1	
	Transcription	1	
Component selection	Wrong volume issued	8	37.1%
	Issued to mother of RhD negative baby	4	
	Issued to woman with immune anti-D	1	
Component labelling	Anti-D Ig mislabelled	4	11.4%
Collection	Collection for the wrong patient	1	2.9%
Total		**35**	**100%**

These near miss errors show similar mistakes to those incidents that progress to patient harm. Consideration should be given to the critical break points where errors occur in order to define whether improvements are possible.

IT-related anti-D Ig cases n=16

There were 16 anti-D Ig cases that also had an IT element and these are described below. The numbers are included in tables above where appropriate, so these are not additional cases. There was 1 clinical error, and 15 laboratory errors.

Error	Unnecessary anti-D Ig administered
Error when manually transcribing data	5
LIMS not updated with reference laboratory result	2
Failure to consult historical record	5
Failure to use flags, logic rules	4
Total	**16**

Table 14.5: IT errors relating to administration of anti-D Ig

This year there were 16 errors where IT systems failed to prevent anti-D Ig being given when it was not required. There were no IT-related errors that resulted in a failure to give anti-D Ig where it was required.

Where the results of RhD testing of the cord blood have to be entered manually onto the LIMS it is possible to transcribe the wrong result.

Where historical data are available, either from the current or previous pregnancies, they should be used in decision-making. Results from reference laboratories (immune anti-D quantification, anomalous D-typing results) should be available to the BMS issuing anti-D Ig. Errors have occurred where these records have not been consulted or when flags to highlight critical information have not been used to prevent issue of unnecessary anti-D Ig.

Computer systems can only be used to support laboratory and clinical procedures, they do not substitute for up to date and accurate knowledge of the importance of correct RhD grouping and the implications of immune anti-D for anti-D Ig prophylaxis. Although using the LIMS in a more robust way could have prevented some of the errors, many of these initial laboratory errors led to incorrect anti-D Ig administration because the clinical areas did not understand the principles of anti-D Ig prophylaxis.

Learning points

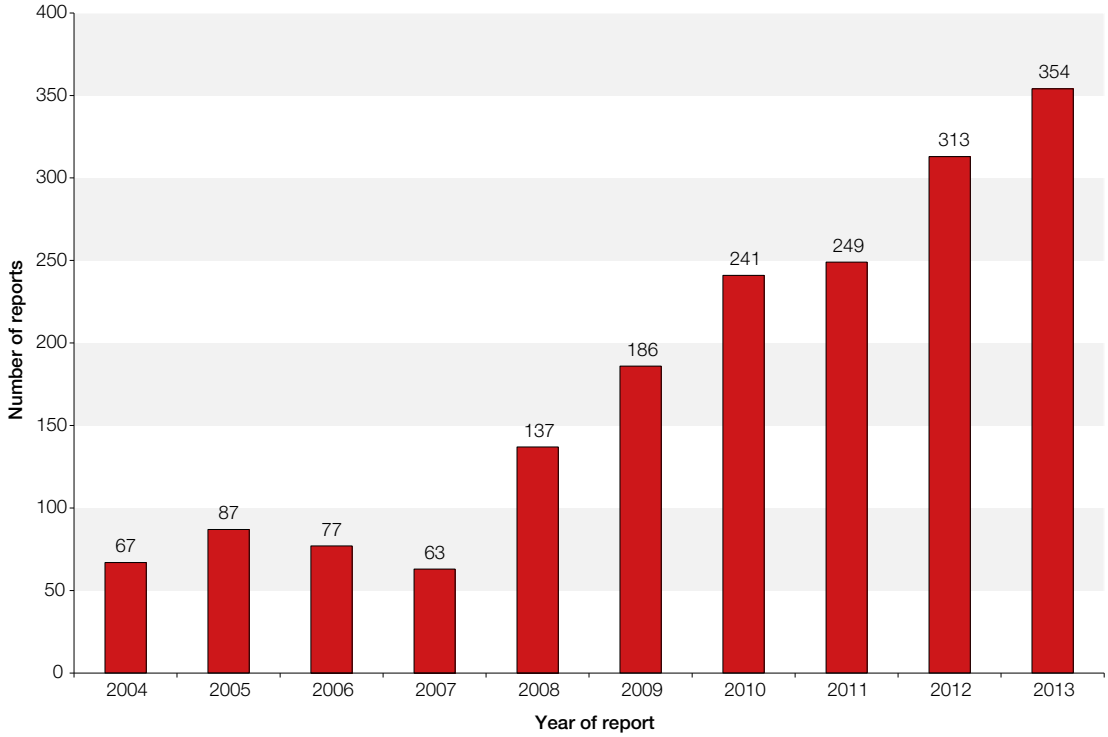
- Electronic transmission of cord RhD-typing results is preferable
- The LIMS should be configured where possible to prevent issue of anti-D Ig where immune anti-D has been documented
- There should be logic rules to prevent issue of anti-D Ig to RhD positive pregnant women and to RhD negative women where the cord blood shows the baby to be RhD negative

COMMENTARY

A total of 354 case reports were reviewed this year, of which 277 (78.2%) related to the omission or late administration of anti-D immunoglobulin. Most of these late or omission events 246/277 (88.8%) occurred after 20 weeks of gestation or at delivery, which are known to be the times of highest risk of sensitisation. This is a continuing worrying situation, putting a significant number of women at risk of potential sensitisation to the RhD antigen with potential mortality and morbidity in affected neonates.

It should be noted that around 10% of the anti-D cases only came to light because of retrospective audit, whether locally or from participation in the National Comparative Audit of anti-D carried out in 2013. This underlines the fact that SHOT can only ever be a ‘snapshot’ of transfusion practice – many errors may simply remain unnoticed or are not reported.

Figure 14.1: Cumulative data for anti-D Ig-related events 2004-2013



While it is easy to pick out errors made by individuals it is clear that there are significant systems failures that contribute to these reports. Nevertheless, individual case studies provide perhaps our most effective method of education in SHOT.

Table 14.4: Examples of system failures

System failure	Examples in SHOT cases
Communication	• A worrying lack of communication between hospital midwifery teams and those in the community – failure of RAADP in the community was identified in 63 cases of delay or omission
Assumption/failing to take responsibility or ownership	• A lack of robust systems for identifying and flagging incomplete work in the laboratory • A lack of robust systems for identifying women eligible for RAADP • A lack of robust systems for handling women who transfer their care or who book late • Assumptions that someone else is sorting out a particular issue
Lack of knowledge/ training	• Failure of laboratory staff to consider the need for anti-D Ig when issuing RhD positive platelets for RhD negative females of childbearing potential (5 cases this year) • A lack of understanding of the principles behind anti-D Ig prophylaxis, compounded by availability of uncontrolled anti-D Ig stocks held by clinics • An increasing trend in poor advice being offered to women by medical staff, often at relatively senior level • Decision-making, issuing and administration of anti-D Ig without reference to blood grouping results, in both the laboratory and clinical area • The misinterpretation of FMH (Kleihauer) tests in hospital laboratories leading to errors in dosing with anti-D Ig • Failure of inventory management in both laboratory and clinical area, especially in the community setting
Pressures of work/ staffing issues	• Understaffing and availability of senior staff in both the laboratory and the clinical area leading to pressurised and poor decision-making
Poor practice/culture	• Manual transcription of blood grouping results onto notes, care plans and discharge sheets in the clinical area, an area of risk that is repeatedly highlighted by SHOT, but persists as poor practice • A culture of completing discharge paperwork when the interventions had not actually been performed • Devolving responsibility to the pregnant women to return at a later date for anti-D Ig administration, when they are obviously in a vulnerable and distressed state instead of managing it at the presentation visit, be that in the emergency department, day unit, or clinic • Use of the Kleihauer test to decide whether anti-D Ig should be given in the first place

The use of checklists to improve processes has been described in many different areas of practice, including surgery [37], and to this end SHOT has produced both a flowchart and checklist covering key points in the process that may be used as an aide memoire, poster or as an audit tool, and these may be found at http://www.shotuk.org/resources/current-resources/. These are also included as an appendix in the recently revised British Committee for Standards in Haematology (BCSH) Guidelines on the use of anti-D immunoglobulin in pregnancy [38]. They are of necessity generic and hospitals wishing to adapt the resources to better fit their own practice should apply to the SHOT Office where a bespoke pdf version can be produced including individual Trust/Health Board logo and version number.

Recommendations

- There must be robust systems in place to identify woman eligible for anti-D Ig prophylaxis and to communicate this information effectively to relevant care teams
- Anti-D Ig must be made readily available for administration to women when they present with potentially sensitising events, rather than putting the onus on them to return for the injection at a later date

Action: Hospital Transfusion Laboratories, Hospital Transfusion Committees, Trust/Health Board Chief Executive Officers (CEOs), Royal College of Obstetrics and Gynaecologists and Royal College of Midwives

Good practice points from previous years

- Current blood grouping and antibody screen results must be referred to when making decisions whether to issue or administer anti-D Ig
- FMH (Kleihauer) screening tests that suggest a TPH of >2mL, or that give equivocal results, should be referred for flow cytometry at the earliest opportunity
- If there is doubt about the RhD type, or whether detectable anti-D is immune or prophylactic, then anti-D Ig prophylaxis should be continued until the issue is resolved [38]
- Peak levels of prophylactic anti-D following administration of 1500IU anti-D Ig will very rarely exceed 0.2IU/mL if administered intramuscular (IM) or 0.4IU/mL if administered intravenously (IV)
- It is important that, regardless of any prior administration of anti-D Ig, any anti-D detected at 28 weeks is quantified and the results made available in the maternity notes [38]
- Anti-D Ig should be subject to the same standards of patient identification (ID) and traceability as blood components (Health Service Circular 'Better Blood Transfusion' 3) [39]
- There should be laboratory oversight of stock control if it is risk-assessed that a remote stock of anti-D Ig is required in a clinical location
- A larger dose of anti-D Ig should be given following delivery of a RhD positive child when cell salvage is used: The BCSH guideline recommends 1500iu as a standard dose [38]
- All healthcare professionals involved in the issue and administration of anti-D Ig must complete the anti-D modules in the Learn Blood Transfusion e-learning programme www.learnbloodtransfusion.org.uk
- Trusts/Health Boards must ensure that there is representation from midwives and obstetricians on hospital transfusion committees, with the aim of jointly drawing up straightforward local protocols for the request, issue and use of anti-D Ig based on well established national guidance
- Cases of late administration, omission, or inappropriate administration of anti-D Ig must be the subject of internal follow-up within Trusts/Health Boards via established governance mechanisms
- All organisations involved in the issue and administration of anti-D Ig must ensure that their systems are robust with respect to issue, receipt and recording, and should audit their systems with a view to increasing the safety and security of the process

- Anti-D Ig prophylaxis for sensitising events should be administered in addition to anti-D Ig given for routine antenatal anti-D prophylaxis (and vice versa)
- Anti-D Ig prophylaxis for sensitising events should be given regardless of the presence of detectable residual prophylactic anti-D or a 'negative' Kleihauer test

Recommendations still active from previous years are available in the 2013 Annual SHOT Report Supplement located on the SHOT website, www.shotuk.org under SHOT Annual Reports and Summaries, Report, Summary and Supplement 2013.

Appendix: SHOT Anti-D Sensitisation Study

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Total cases analysed n=31

Introduction

From January 2013 SHOT has requested data on women who have produced immune anti-D that is found for the first time in the current pregnancy, whether detected at booking or later in the pregnancy.

Background

The introduction of anti-D Ig prophylaxis in pregnancy, initially for sensitising events in pregnancy and postpartum, and more recently as routine antenatal practice (RAADP) was predicted to reduce the incidence of anti-D sensitisation and haemolytic disease of the newborn secondary to anti-D. An update from the National Institute for Health and Care Excellence (NICE) in August 2008 [40] reviewed the available evidence and concluded that the practice should continue but that further research was required on optimal dosing. A more recent meta-analysis [41] of the available, relatively poor quality trial data reached the same conclusion. The efficacy of anti-D Ig requires not only that the intervention be effective, but that it is adminstered appropriately after potentially sensitising events and routinely in the antenatal and postpartum periods [42]. Since its start in 1996, SHOT has collected data about adverse events related to the prescription, requesting, adminstration or omission of anti-D Ig which have potential to cause harm to the mother or fetus immediately or in the future. From 2006 these data were actively sought but SHOT has been unable to undertake long term follow up of such cases nor identify the number of subsequently sensitised pregnancies.

Recent reports [43-45] have demonstrated a lack of detectable anti-D at delivery in women who have received RAADP and have raised concerns by commentators [46, 47] about the adequacy of current recommended practice in preventing sensitisation, particularly in overweight/obese women and in pregnancies that continue beyond 40 weeks. However, there is no systematic process for collecting data on anti-D sensitisation rates prospectively. A single centre retrospective study of 56 sensitised pregnant women [48] demonstrated that 48% of cases were due to potentially preventable causes, 'process failure', and would be SHOT-reportable. However, 20% of cases were not preventable, of which 16% occurred despite full RAADP and postpartum anti-D Ig administration.

One of the suppliers of anti-D Ig (CSL Behring) has recently amended their summary of product characteristics (SPC) following unpublished reports that the intramuscular administration of Rhophylac in patients with a body mass index (BMI) ≥30 is associated with a risk of lack of efficacy. For patients with a BMI ≥30 they now recommend intravenous administration. Such a recommendation has significant implications for maternity units and is being urgently discussed by the British Committee for Standards in Haematology Transfusion Task Force (personal communication). The end-point of effective RAADP is prevention of sensitisation and accurate data must be available to inform clinical practice. This new initiative by SHOT should address this lack of efficacy data for anti-D Ig prophylaxis.

Methods and results

For any women reported to SHOT as having immune anti-D detectable for the first time in the current pregnancy, there are supplementary questions about the pregnancy occurring immediately before the index pregnancy, recorded sensitising events, anti-D Ig prophylaxis, and outcome. It is hoped that the data will provide a better understanding of the causes of continuing anti-D sensitisations.

By the end of 2013 a total of 35 cases had been reported, although in 2 cases data were incomplete meaning there was insufficient information for analysis. Ten cases occurred in primagravidae and 23 in women with previous pregnancies, but 2 of these cases were excluded from analysis as immunisation had occurred prior to the index pregnancy, so 21 cases from multiparous women were analysed.

Primagravidae n=10

- In all cases anti-D was detected after 28 weeks gestation
- 4 women weighed <68kg at booking (assume normal BMI based on average female height in UK), 2 women weighed >68-80kg (overweight) and 2 women were >80kg (obese), there was no information in 2 reports
- All women received correctly administered RAADP as a single 1500IU dose of anti-D Ig at 28 weeks
- In 7 women there was no identifiable sensitising event during the pregnancy
- In 3 women (4 events) sensitising events occurred: 3 antepartum haemorrhages (APH) and 1 fall. In 3 instances the women received appropriate treatment including a Kleihauer test (where appropriate) and anti-D Ig within 24 hours
- Peak anti-D was <4iu/mL in 4 cases, >4iu/mL in 3 cases. No information was available in 3 cases
- No pregnancies required antepartum intervention
- All pregnancies resulted in live births, of which 6 had no complications, but 3 babies required phototherapy and 1 baby required exchange transfusion

Multiparous women n=21

Note: 'previous pregnancy' refers to the pregnancy occurring immediately before the index pregnancy

- In 10 women anti-D was first detected at booking, in 8 women during the pregnancy and in 3 women at term
- The weight in previous pregnancy: <68kg at booking in 6 women, 68-80kg in 1 woman, >80kg in 3 women, no information in 11 women
- The weight in current pregnancy: <68kg at booking in 4 women, 68-80kg in 2 women, no women were >80kg, and there was no information in 15 reports
- RAADP in previous pregnancy: 11 women correctly received one dose (1500IU) regimen, 2 women correctly received two dose (500IU) regimen, 4 women did not receive RAADP and in 4 reports there was no information
- RAADP in current pregnancy: 9 women correctly received one dose (1500IU) regimen, 10 women did not receive RAADP as they were already immunised, in 2 cases there was no information
- Sensitising events in previous pregnancy: no identifiable event in 12 women, no information in 5 reports and identifiable events were noted in 4 women (3 APH, 1 fall) of which 3 were managed correctly with anti-D Ig
- Sensitising events in current pregnancy: no identifiable event in 11 women and 10 women were already sensitised
- Method of delivery in previous pregnancy: vaginal delivery in 5 women, elective caesarean section in 2 women, emergency caesarean section in 2 women and there was no information in 12 cases

- Gestation at delivery in previous pregnancy: no information yet as not requested on original data collection proforma (this has been added to the proforma for 2014 onwards)
- Postpartum prophylaxis in previous pregnancy: 14 women had Kleihauer test performed and received appropriate dose of anti-D Ig (2 women received a higher dose following positive Kleihauer test), 2 women did not receive postpartum anti-D Ig and in 5 reports this information was not available
- RhD type of baby: in previous pregnancy baby was RhD positive in 16/21 cases and information was not available in the other 5 cases
- Peak anti-D was <4iu/mL in 9 cases, >4iu/mL in 9 cases. No information was available in 3 cases
- Antepartum intervention was only required in one woman where ultrasound was performed to exclude fetal anaemia
- Pregnancy outcome information was available for 7 women - all were live births, 2 babies required phototherapy and 1 baby required exchange transfusion

COMMENTARY

These are very preliminary data so that it is not possible to draw any conclusions. However a larger more complete data set should provide much needed evidence about the reasons for continuing anti-D sensitisation. In the light of recent concerns regarding a ***potential*** trend for lack of efficacy (or reduced efficacy) in patients with a BMI ≥30 who are receiving Rhophylac via the intramuscular (IM) route of administration, we will now collect additional data about the previous pregnancy including weight and gestation at delivery and on the route of anti-D Ig administration. There are many gaps in the data, as it is likely that reporters are starting a file when anti-D is detected in the index pregnancy but do not complete the report once delivery has occurred. SHOT will be setting up a robust system to capture outcome data.