Anti-D Prophylaxis

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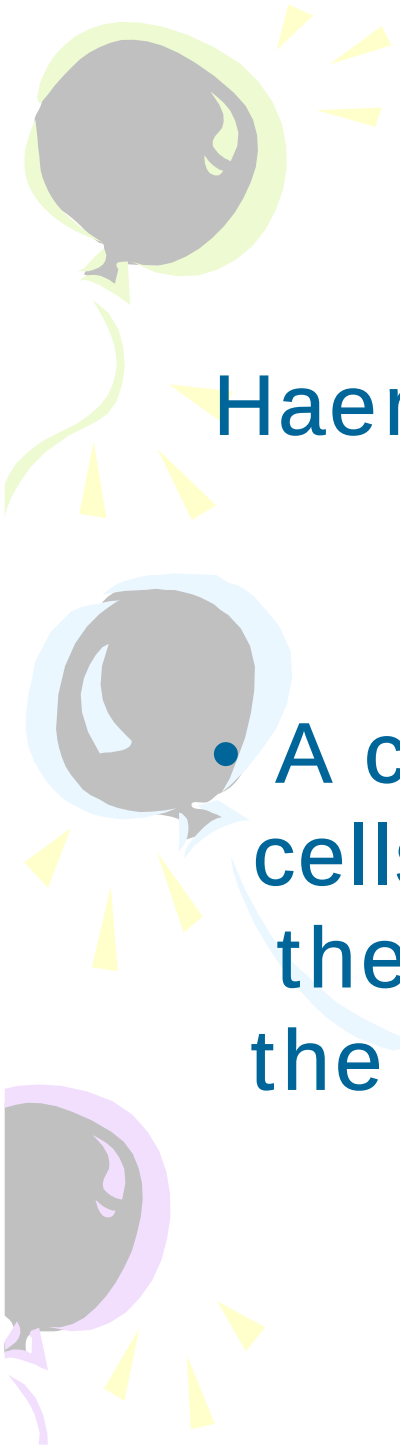
Anti-D Prophylaxis

Back to Basics

- History
- Immune response
- Rh (D) prophylaxis
- Estimation of fetal bleeds
- Common errors



Anti-D Prophylaxis

Haemolytic disease of the newborn (HDN)

- A condition where the infant's red cells are prematurely destroyed by the action of specific antibodies in the maternal blood which cross the placenta during pregnancy.

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- 1609:The first description of a neonatal disease, almost certainly due to Rh HDN, can be found in the memoirs of a French midwife, Louise Bourgeois.

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- 1939: Levine and Stetson showed that HDN was caused by an antibody in the maternal plasma.
- 1940:”Rh factor” discovered by Landsteiner and Weiner
- 1941: Levine et al tested the antibody against the parents of HDN infants
- 1945 Coombs, Mourant and Race showed that HDN was caused by maternal antibodies crossing the placenta

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- 1956:It was shown that ABO incompatibility affords substantial protection against HDN
- 1969: First injection of Anti-D given
- 1971: First controlled trial of Anti-D given post delivery
- 1974: MRC working party reported on the trials and agreed the dose.

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1969: post natal anti-D introduced

1976: extended to miscarriages and terminations

1981: sensitising events in pregnancy

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Effectiveness of the program

1969 46 deaths in 100,000 births
(HDN in 1% of neonates)

1990 1.6 deaths in 100,000 births

But it was still occurring and shown to be following sensitising events in the third trimester

2002: RAADP introduced following NICE recommendation

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THE IMMUNE RESPONSE

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Primary antibody response

- Antibody usually detected 8-9 weeks after sensitisation
  - 10-15% non responders
  - 10-15% very good responders
- Weak IgM response followed by IgG
  - IgM antibodies cannot cross the placenta
  - IgG antibodies can

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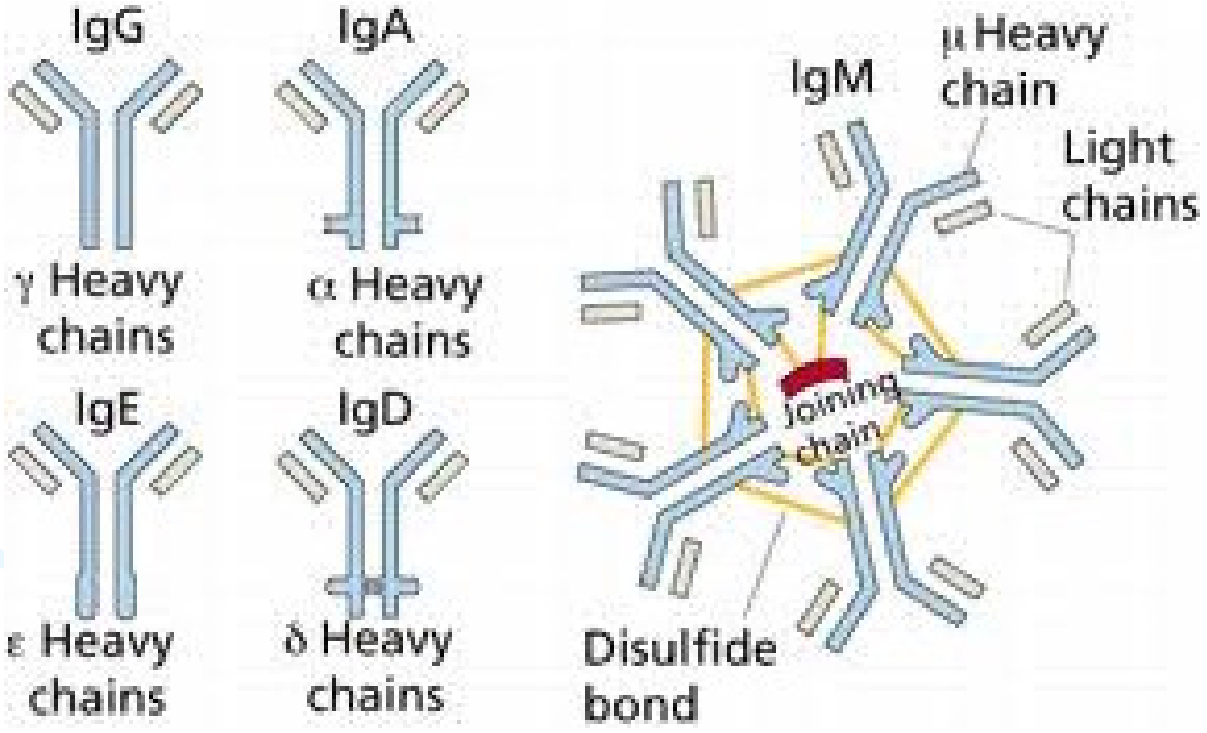

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Secondary antibody response

- Second exposure leads to rapid rise in IgG antibody level from 3 days
- Secondary response requires a small stimulation (<0.3ml)

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Sensitising events

- Amniocentesis
- Cordocentesis
- Other in-utero therapeutic intervention
- Ante-partum haemorrhage
- Ectopic pregnancy
- External cephalic version
- Fall/abdominal trauma
- IUD
- Miscarriage
- Termination

Any sensitising effect should be considered for anti-D even after RAADP

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RECURRENT BLEEDING

- <12 weeks probably not necessary
- 12-20 weeks 250iu every 6 weeks
- >20 weeks 500iu every 6 weeks + Kleihauer screen

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Anti-D preparations available

250iu, 500iu and 1500iu

Minimum recommended dose is:

250iu before 20/40

500iu after 20/40

Routine ante-natal prophylaxis is either 1500iu at 28/40 or 500iu at 28/40 repeated at 34/40

Post-natal dose is 500iu as a routine.

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ESTIMATION OF FETO-MATERNAL HAEMORRHAGE

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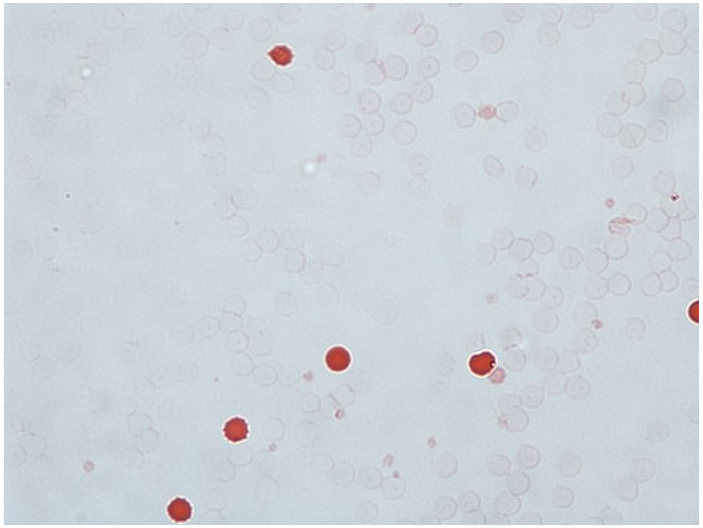
Kleihauer film (Acid Elution)

- Good for screening and initial assessment
- Subjective



- Not recommended as a test at <20 weeks
- Not suitable as a diagnostic test for a placental abruption

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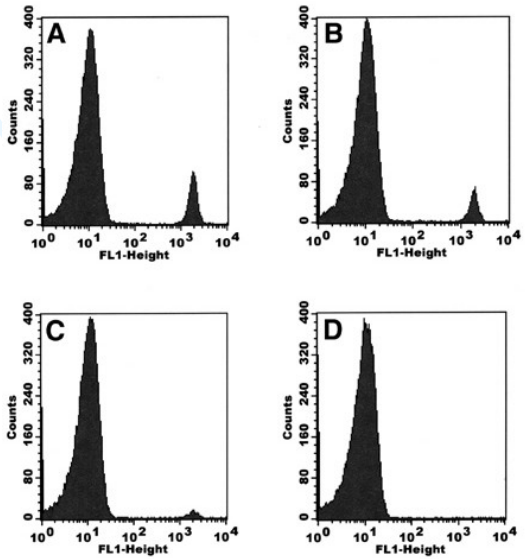
Flow cytometry

- Expensive
- More accurate
- Reference/confirmatory method
- Not always available to all labs quickly



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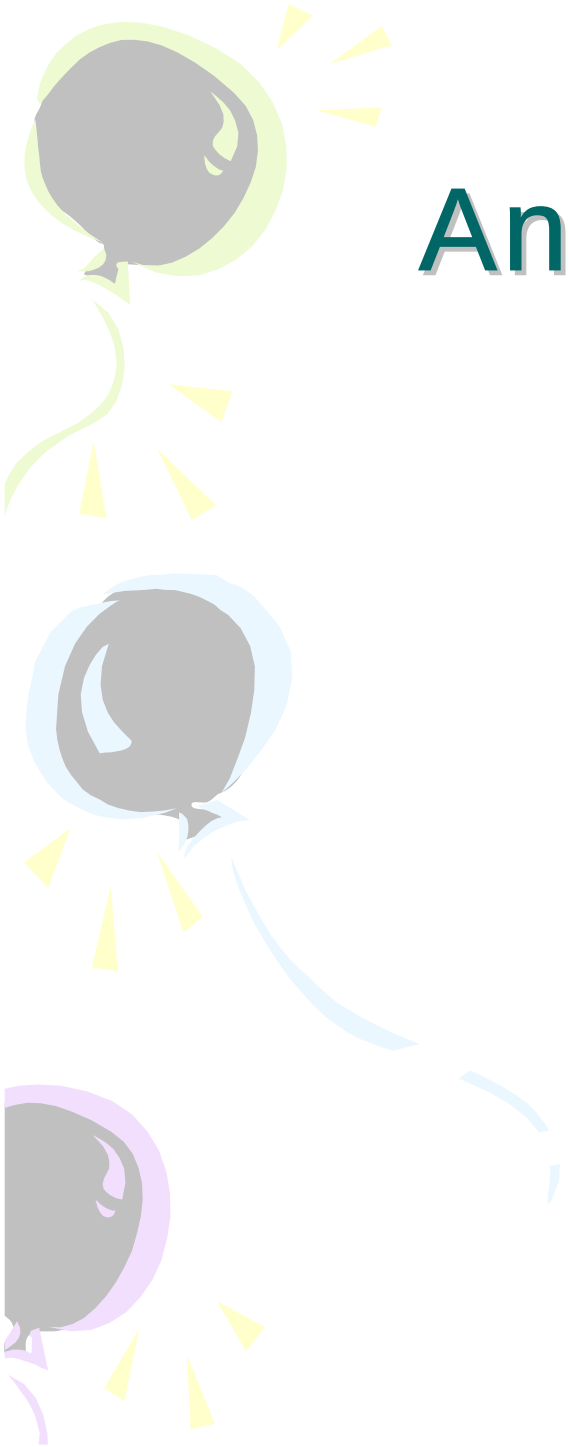
PROBLEMS ENCOUNTERED

- Differentiation between PAD and immune anti-D
- Raised HbF due to pregnancy or genetic disorder



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COMMON ERRORS

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SHOT REPORT 2011

Type of event	Cases
• Omission/late administration	157
• Given to Rh Pos woman	30
• Given to woman with immune anti-D	17
• Given to mother of Rh Neg infant	9
• Given to wrong woman	4
• Wrong dose given	24
• Handling and storage errors	8
• Total	249

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LEARNING POINT

Consider issuing anti-D on a named patient basis only

www.shotuk.org

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SHOT REPORTS

- SHOT started 1996
- Recurrent themes include:
- Communication failures between hospital and community midwives
- Lack of a robust system for receiving anti-D Ig for RAADP
- Failure of the post-natal discharge checklist
- Poor advice from inexperienced laboratory staff
- Poor advice from midwives regarding the need for anti-D following sensitising events
- Failure by both lab and clinical staff to follow up women with positive antibody screens in pregnancy and an assumption that the result reflected PAD when in fact none had been given
- Inappropriate use of Kleihauer test to determine the need for anti-D

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SHOT LEARNING POINTS

- Kleihauer test is used to determine if additional anti-D is required……..not whether anti-D is needed in the first place

- Interpretation of positive antibody screens in pregnancy must be the responsibility of senior laboratory staff and must take into account an accurate history

- Partnership between the laboratory and the clinical area. Clinicians must be more responsive to requests for follow up samples and the lab must not assume that actions have been taken purely because a report has been issued.

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