

DAT pilot – learning points relevant to HTR investigations

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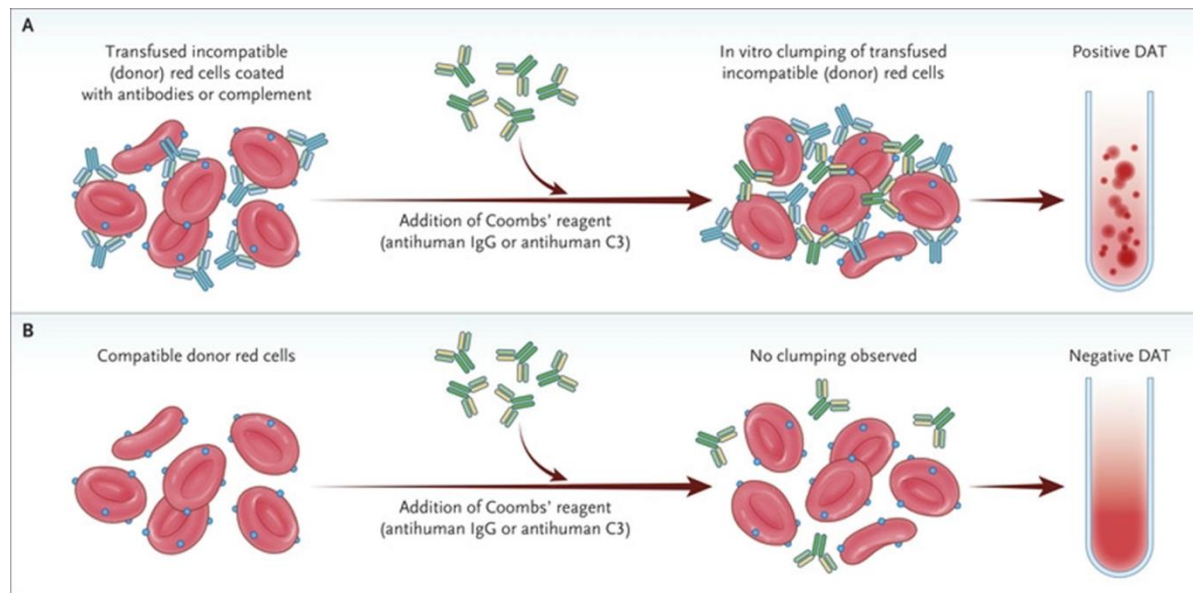
UK NEQAS

Blood Transfusion Laboratory Practice

Joint Annual Meeting 2019

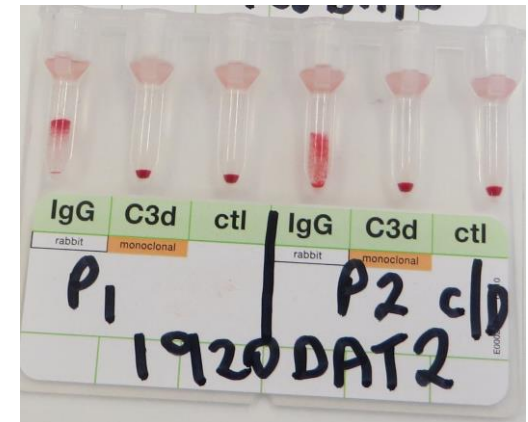
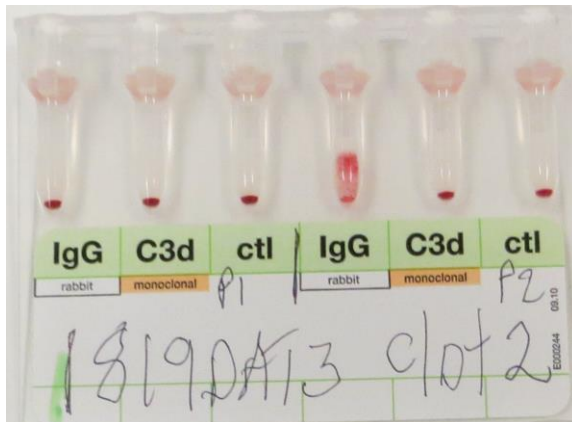
DAT pilot

- 2015
 - Initial studies - stability of red cells coated with IgG or complement
- Two samples four times per year, one week exercise time period
- Exercises have included
 - uncoated cells, strong positive and weak positive coated with IgG, and weak positive coated with complement.
- A data entry portal on the UK NEQAS website was developed
 - questions regarding the use of the DAT



DAT pilot

- Assessment
 - Results were initially going to be assessed based upon reported reactions
 - Now based upon the clinical interpretation
 - A scoring system has been developed, to be implemented soon
- Since 2016, several learning points relevant to clinical practice have been the subject of reports, based upon the errors made during exercises.



1. Learning outcome - False positives and false negatives

	Number of reactions vs. reagent					
Red cell coating	Polyspecific AHG		Anti-IgG		Anti-C3d	
	False negative (%)	False positive (%)	False negative (%)	False positive (%)	False negative (%)	False positive (%)
Uncoated	-	9/371 (2.4)	-	11/374 (2.9)	-	1/274 (0.4)
Coated with IgG	19/932 (2.0)	-	14/1307 (1.1)	-	-	144/1286 (11.2)
Coated with complement	6/193 (3.1)	-	-	30/274 (10.9)	2/270 (0.7)	-

Data collated from four exercises

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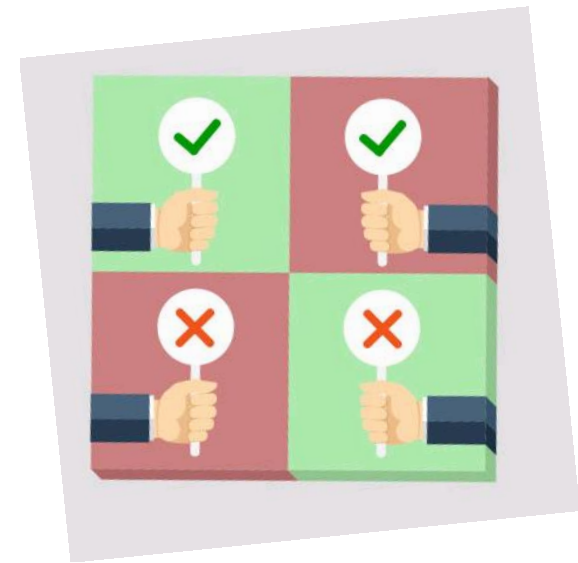
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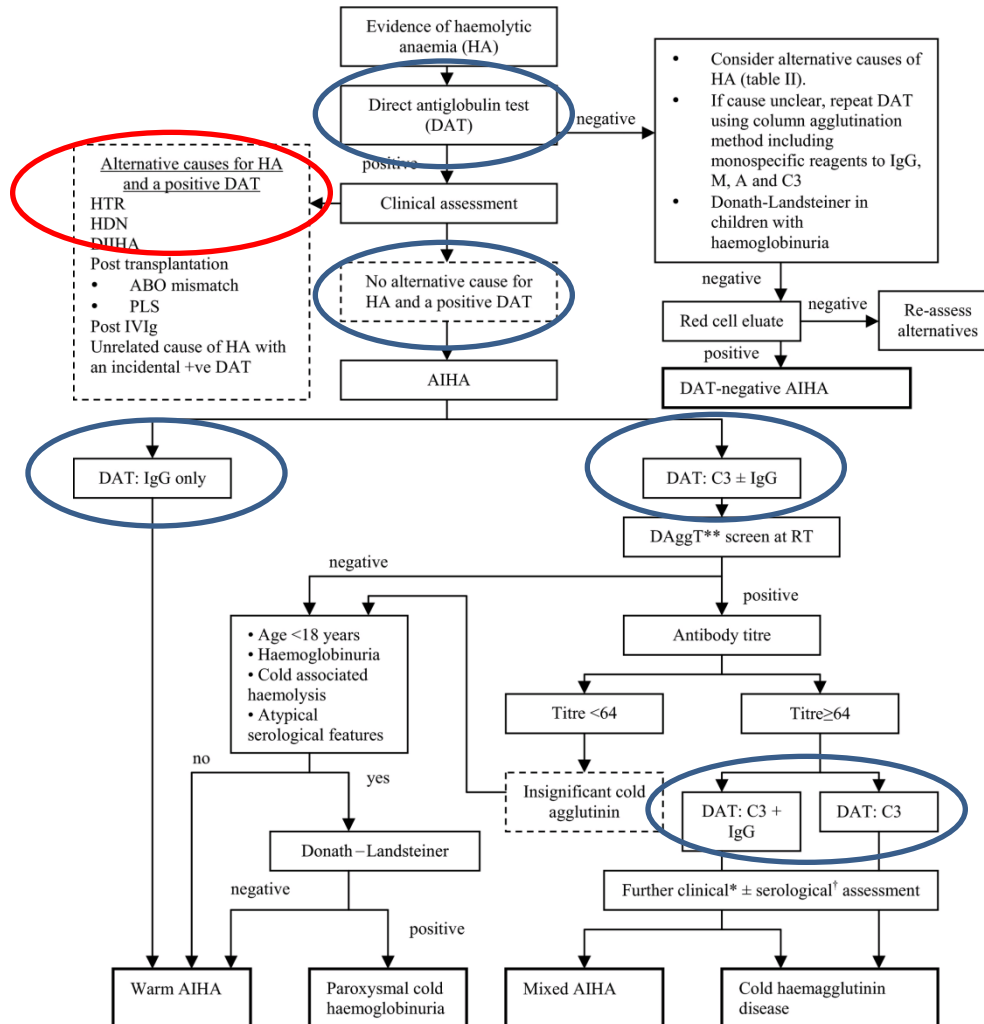
Clinical implications

- False positive and false negative results
 - there is some misreporting of DAT results
 - The highest error rate was in reporting the coating molecule for samples coated with IgG or complement, majority of these being reported as an additional molecule
 - Reporting of false negative reactions for samples coated either with IgG or complement.
 - Both of these types of error have potential to confound a differential diagnosis of AIHA
 - False negative results possibly leads to incorrectly ruling out a HTR



Guidelines

- <https://b-s-h.org.uk/guidelines/guidelines/the-diagnosis-and-management-of-primary-autoimmune-haemolytic-anaemia/>
- At a minimum, the DAT should include monospecific anti-IgG and anti-C3d



Guidelines

Table 1. Investigation of moderate or severe acute transfusion reactions [for detailed guidance and references see Appendix 2 of the full guideline (http://www.bcsghguidelines.com/documents/ATR_final_version_to_pdf.pdf)]

Symptoms	Investigations
Fever ($\geq 2^{\circ}\text{C}$ rise or $\geq 39^{\circ}\text{C}$), and/or chills, rigors, myalgia, nausea or vomiting and/or loin pain	<p>Standard investigations[*]</p> <p>Take samples for repeat compatibility testing, DAT, LDH and haptoglobin</p> <p>Take blood cultures from patient</p> <p>Coagulation screen</p> <p>Do not discard implicated unit</p> <p><i>If febrile reaction sustained, return unit to laboratory, repeat serological investigations (compatibility testing, antibody screen and DAT), haptoglobin and culture unit</i></p> <p><i>If loin pain, perform serological investigations as above</i></p>
Mucosal swelling (angio-oedema)	<p>Standard investigations[*]</p> <p>Measure IgA level (EDTA sample)- if < 0.07 g/l, and no generalized hypogammaglobulinaemia, perform confirmatory test with sensitive method and check for IgA antibodies</p>
Dyspnoea, wheeze, or features of anaphylaxis	<p>Standard investigations[*]</p> <p>Check oxygen saturation or blood gases.</p>

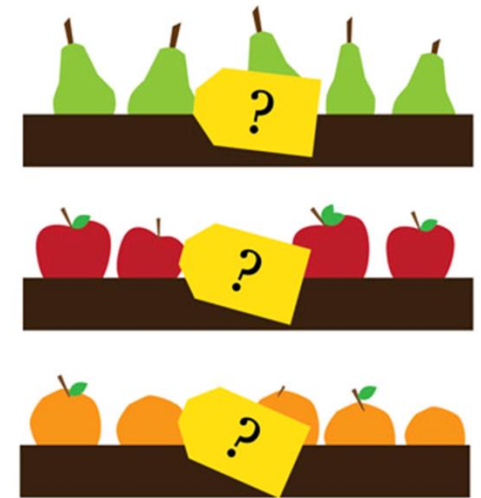
DAT, direct antiglobulin test; Ig, immunoglobulin; LDH, lactate dehydrogenase.

^a Standard investigations: full blood count, renal and liver function tests, and assessment of urine for haemoglobin

<https://b-s-h.org.uk/guidelines/guidelines/investigation-and-management-of-acute-transfusion-reactions/>

2. Learning outcome – subjective reaction grades

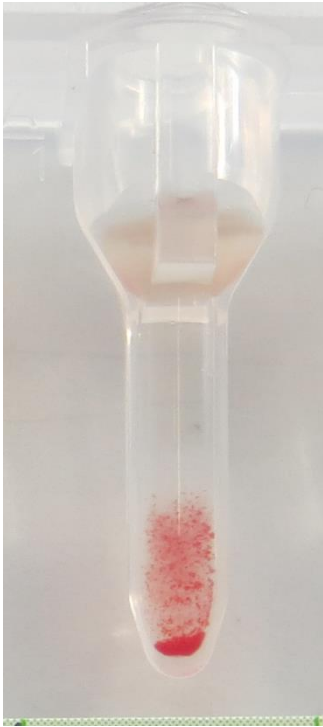
- Subjectiveness of reaction grading
 - Operator
 - Technology/
manufacturer
 - Day of testing during
exercise duration
 - Automated/ manual read



Time for the interactive bit!



1. Grade this reaction!



- Reactions:-
 - Negative
 - Mixed field/dual population
 - Weak
 - 1+
 - 2+
 - 3+
 - 4+

2. Grade this reaction



- Reactions:-
 - Negative
 - Mixed field/dual population
 - Weak
 - 1+
 - 2+
 - 3+
 - 4+

3. Grade this reaction!



- Reactions:-
 - Negative
 - Mixed field/dual population
 - Weak
 - 1+
 - 2+
 - 3+
 - 4+

Recommendations

- To reduce the potential for procedural errors, checks are required at critical points in the pre-transfusion process, e.g. sample labelling, performing and interpreting manual tests and transcribing information.
- It is important that all users are aware of the limitations of technology that is used for any application in the blood transfusion laboratory, and that manufacturer's instructions are understood and followed. Laboratories should have clear policies for defining and investigating anomalous results, and all staff undertaking testing and reporting have the knowledge required to recognise potential sources of error, including those specific to the technology in use.



*Thank You For
Listening*