National School of Healthcare Science

NHS England

IACC 2023 Case-based discussion (CBD) scenario

Specialty:	Haematology and Transfusion Science

CBD Scenario

CBD Scenario Title	The investigation of a Pan-reactive antibody									
CBD Scenario Aim	The candidate should be able to recommend appropriate tests to undertake depending on the diagnosis / clinical history.									
CBD Focus (please provide the codes of the module(s) this scenario addresses)	SLS144									
GSP Domains covered (enter X to indicate all that apply)	**GSP 1**	X	**GSP 2**	X	**GSP 3**	X	**GSP 4**		**GSP 5**	X
CBD Scenario description	Patient presents to your laboratory with a pan-reactive antibody. What further workup would you suggest and further clinical information which may provide useful answers.									
CBD Scenario model answer/ assessor guidance Detailed guidance that will be available for the assessors. Include guidance on what kinds of behaviours, actions, comments should secure a pass. What should the assessor expect to see? Assessors will be asked to plan questions in advance including links to trainee's IACC submission.	**Pass indicators:** The candidate should ask what the clinical history of the patient is to determine whether the case is likely to be one of the following: • Autoimmune Haemolytic Anaemia (AIHA) • Therapeutic monoclonal antibody (anti-CD38 or anti-CD47) • Antibody to a high frequency antigen • Mixture / combination of alloantibodies They should also ask the following - answers in (brackets) • Clinical History / suspected diagnosis (AIHA) • Previously seen in the HTL – is there a record of the patient on the LIMS? Are they known or new? (New)									

	• Ethnicity of the patient (White Caucasian): • Recent transfusion (none) • Past pregnancy history (none) • Urgency of transfusion (3 units requested ASAP - suspected AIHA) • ABO Rh / K group (Gp A D pos C+c+E-e+ (R1r) K- • Any other phenotypes / genotype on record? (none) • Strength of reactivity (pan-reactive in IAT (3+) and with papain treated cells (4+) • Autologous (self) control result (Positive 3+ in IAT) **Further workup:** The following tests should be performed, based on the clinical history given. They are normally performed at the regional Red Cell Immunohaematology (RCI) Reference laboratory: • Direct Antiglobulin Test (DAT) to classify 'type' of AIHA. • Warm AIHA – IgG pos only • Mixed AIHA – IgG + c3d • Cold AIHA – IgM +/- c3d Perform an adsorption using either autologous cells (autoadsorption) or differential alloadsorption using a set of alloadsorption cells (x2) to exclude the presence of underlying alloantibodies. Test the adsorbed plasma against a standard panel of cells by IAT to identify and / or exclude the presence of underlying clinically significant alloantibodies (there are no underlying antibodies in this case scenario). **Ask about the pros and cons of auto / alloadsorption** **Pros of using autologous cells:** • No need for differential adsorption to detect underlying alloantibodies as cells are patient's own. • Can adsorb without the risk of adsorbing out an antibody to a HFA. **Cons of using autologous cells:** • Not normally enough cells to perform autoadsorption as the patient is anaemic. • Cells are already coated with IgG so may not be as effective at removing autoantibody from the plasma (might mention ZZAP treatment to remove bound IgG and make cells suitable, but this is quite advanced) • Process of adsorption is time consuming, can introduce delay to the patient.

	• Risk (small) of diluting any underlying antibodies with the process of serial adsorption **Pros of using alloadsorption cells** • Most likely method of adsorption in reference lab as cells available as a standardised CE marked reagent. • Papain treated to enhance removal of autoantibody • Sufficient quantity supplied for use • Enables the identification of underlying alloantibodies **Cons of using alloadsorption cells** • Will adsorb out antibodies to high frequency antigens (HFA) • Process of adsorption is time consuming, can introduce delay to the patient. • Risk (small) of diluting any underlying antibodies with the process of serial adsorption **Eluate** Not needed in this case as the patient has not been transfused. Only required if recently transfused (</=3 months) or if DAT negative AIHA seen with evidence of haemolysis. **Genotype or Phenotype** Genotyping may be required if adsorption does not work, if the patient has been recently transfused, or has a positive DAT (particularly if it's pos with IgM +/- c3d) or if adsorption works and there is an underlying alloantibody, to confirm the patients red cell genotype and to aid with the provision of matched blood. This would normally be done in routine hours, and only if the adsorption did not work to remove all of the alloantibody. Occasionally if a genotype is already known and blood is readily available, then genotype matched units will be issued (matched for Rh, K, MNS, Fy and Jk antigens) Phenotyping may be possible if directly agglutinating phenotyping reagents are used, and the patient hasn't been recently transfused however there is the risk of false positive reactivity if there are cold agglutinins present. Genotyping would be preferable in routine hours and if underlying alloantibodies are found in the adsorbed plasma, antigen negative units should be selected as a precaution in the interim, whilst genotyping results are pending. **Crossmatching** Should be undertaken using native (unadsorbed) and adsorbed plasma in parallel. Units issued using the adsorbed plasma should be ABO / Rh and K matched (E-, K-) and negative for any alloantibodies detected in the adsorbed plasma. Units should be issued as 'suitable' rather than 'compatible' as the plasma has been manipulated in order to undertake the crossmatch.

	Further testing / additional samples If mixed or Cold AIHA then a room temperature screen would indicate the presence of cold agglutinins and would necessitate recommending using a blood warmer and keeping the patient warm during transfusion. Other indicators of cold agglutinins would be; agglutinins on the blood film; deranged FBC values; interference in ABO typing. If a patient has a positive room temperature screen and a clinically significant cold agglutinin is present, then additional samples should be referred for cold agglutination titration and thermal amplitude testing. **Additional actions** Contact the on-call haematology consultant and advise that the patient has AIHA and units have been requested ASAP. There may be a delay in supply of units from the reference service and so a 'Plan B' for blood transfusion may be required if the patient needs transfusing before blood from the RCI laboratory arrives. In this case the most suitable blood for transfusion in an emergency would be: ABO compatible (Gp A or O) Rh/K matched (E- K-) least incompatible by IAT XM If not already on steroids for AIHA then if transfusion is required urgently the haematologist may give the above with Steroid cover +/- IvIG if considered appropriate. **Fail indicators:** Does not consider the clinical presentation of the patient and fails to advise on appropriate further testing or blood provision in an emergency situation.
Trainee instructions Please include any specific information to be provided to the trainee as part of the CBD scenario	If you want to, you can include extra info that can be given to the student, if requested (e.g., full Rh type) Clinical History / suspected diagnosis (AIHA) Previously seen in the HTL – is there a record of the patient on the LIMS? Are they known or new? (New) Ethnicity of the patient (White Caucasian): Recent transfusion (none) Past pregnancy history (none) Urgency of transfusion (3 units requested - suspected AIHA) ABO Rh / K group (Gp A D pos C+c+E-e+ (R1r) K-) Any other phenotypes / genotype on record? (none)

	Strength of reactivity (pan-reactive in IAT (3+) and with papain treated cells (4+) Autologous (self) control result (Positive 3+ in IAT)

Criteria being assessed by this CBD scenario

Aspect	**Please indicate if this criterion is being assessed**
1. Understands the clinical context of the scenario, including priority setting and testing strategies	X
2. Understands scientific principles of scenario	X
3. Can discuss the relevant procedures involved in the scenario and associated health and safety issues	X
4. Understands and applies the appropriate test validation, IQC, EQA, relevant professional/clinical guidelines	
5. Understands and applies associated IT/bioinformatics and other appropriate resources	
6. Is able to interpret and report patient results and provide appropriate clinical advice	X
7. Can discuss the significance of patient results within the clinical context of the referral	X
8. Understands the ethical, legal and social implications of the scenario	
9. Is aware of the importance of audit and can use this tool effectively	
10. Output meets accepted laboratory/professional standards	
11. Demonstrates awareness of the limits of responsibility and when to seek advice	
12. Consideration of patient/professionalism	
13. Overall ability to perform	