1-E. Crossmatching by Immediate-Spin

Purpose

To provide instructions for performing an immediate-spin (IS) crossmatch:

- Detection of ABO incompatibility between donor and recipient when unexpected antibodies are absent in the recipient, either currently or by history.

Background Information

High-titer IgG Anti-A and/or Anti-B may fix C1 (the first component of human complement) to red cells, and this can sterically hinder agglutination. Unwanted negative reactions resulting from this phenomenon can be prevented by using EDTA-anticoagulated plasma for IS crossmatching or by suspending donor red cells in EDTA-saline. EDTA chelates ionized calcium (Ca^{++}), which is essential for the integrity of the C1 molecule.

Operational Policy

IS crossmatching must be limited to samples from patients who lack unexpected antibodies.

DO NOT READ TESTS MICROSCOPICALLY because unwanted positive reactions may occur.

Limitations

Unwanted Positive Reactions:

- Auto- or alloantibodies.
- Contaminated samples.
- Polyagglutination.
- Polycarboxyl-dependent antibody.
- Passive antibody.

Unwanted Negative Reactions:

- Omission of red cells or test sample.
- Contaminated sample.
- Weakly reactive Anti-A and/or Anti-B.
- Newborn sample.
- Weakly expressed A and/or B antigens on donor red cells.

Sample Requirements

Clotted or EDTA-anticoagulated whole blood as a source of serum or plasma.

Note: If the patient has received Red Blood Cell (RBC) transfusion or has been pregnant within the preceding 3 months, or if the history is uncertain or unavailable, the sample must be obtained within 3 days of scheduled transfusion.

Equipment/ Materials

Normal saline if EDTA-anticoagulated plasma is used for the IS crossmatch.

EDTA-saline if serum is used for the IS crossmatch.

A_1 and B reagent red cells.

ABO-compatible donor red cells.

Quality Control

Perform serum/plasma ABO grouping tests concurrently with the IS crossmatch.

Procedure

Use the following steps to perform the procedure:

Step	Action	
1.	**If using…**	**Then…**
	serum	prepare a 3%-5% EDTA-saline suspension of test red cells (each donor sample; A_1 and B controls) in appropriately labeled test tubes.
	plasma	prepare a 3%-5% saline suspension of test red cells (each donor sample; A_1 and B controls) in appropriately labeled test tubes.
2.	In appropriately labeled 10 or 12 × 75-mm test tubes, add 2-3 drops of serum or plasma and 1 drop of each of the appropriate red cell suspensions.	
3.	Gently mix the contents within each tube: • Centrifuge. • Dislodge the cell buttons gently. • Examine macroscopically for agglutination. • Grade and record the results.	

<table>
<tr><td>4.</td><td colspan="3">Interpret the results of the IS crossmatches as follows:</td></tr>
<tr><td></td><td>If donor red cells are…</td><td>And controls are…</td><td>Then…</td></tr>
<tr><td></td><td>nonreactive</td><td>in accord with patient’s ABO group</td><td>tests are valid:
• Issue blood for transfusion.</td></tr>
<tr><td></td><td>reactive</td><td>in accord with patient’s ABO group</td><td>suspect cold-reactive auto- or alloantibodies:
• Crossmatch by Procedure 1-C.</td></tr>
<tr><td></td><td>nonreactive</td><td>not in accord with patient’s ABO group</td><td>tests are invalid:
• Confirm red cell ABO group of patient and donor.
• Blood may be released if ABO compatible.</td></tr>
<tr><td></td><td>reactive</td><td>not in accord with patient’s ABO group</td><td>do not release units:
• Issue group O RBCs.
• Investigate problem.</td></tr>
</table>

References

Code of federal regulations. Title 21 CFR Parts 606 and 660. Washington, DC: US Government Publishing Office, 2020 (revised annually).

Cohn CS, Delaney M, Johnson ST, Katz LM, eds. Technical manual. 20th ed. Bethesda, MD: AABB, 2020 (or current edition).

Gammon RR, ed. Standards for blood banks and transfusion services. 32nd ed. Bethesda, MD: AABB, 2020 (or current edition).

Judd WJ, Steiner EA, O’Donnell DB, Oberman HA. Discrepancies in ABO typing due to prozone: How safe is the immediate-spin crossmatch? Transfusion 1988;28:334-8.