New York Blood Center Enterprises
Lifesaving impact, innovation, and research.

Insights from Isoagglutination Titers

Cheryl Kirchner and Maisee Her
Immunohematology Reference Laboratory, Innovative Blood Resources, Saint Paul, MN, USA

INTRODUCTION/ABSTRACT

Isoagglutination titers on group O platelet and whole blood units identify donors containing high anti-A and/or anti-B titers to reduce the risk of hemolytic transfusion reactions with ABO-mismatched units.

The purpose of this analysis is to compare the impact of different test methods and titer limits upon standardization efforts that changed the titer threshold from <1:250 (250 method) to <1:100 (100 method).

Interpretation is limited by non-overlapping testing periods between methods.

MATERIALS AND METHODS

250 Method
- The 250 method defined a unit as low titer when anti-A is <1:250.
- Each unit was tested by diluting donor plasma with isotonic saline.
- Diluted sample and 3-5% A1 cell suspension were mixed, incubated at room temperature for 5 to 10 minutes, centrifuged, then graded for agglutination.

100 Method
- The 100 method defined a unit as low titer when anti-A and/or anti-B are <1:100.
- Each unit was tested by diluting donor plasma with isotonic saline.
- Diluted sample and 3-5% A1 or B cell suspension were mixed, centrifuged, then graded for agglutination.
- Platelet donors were tested for anti-A titers only and whole blood donors were tested for both anti-A and anti-B titers.

- All testing was performed by tube technique.
- Observed agglutination was interpreted as high titer.
- No agglutination was considered low titer.

RESULTS

- A total of 18,658 samples were tested between January 2023 and December 2025.
  - 12,985 were platelets and 5,673 were whole bloods.
- The percentage of low titer units decreased.
  - Combined low titer rates declining from 93% (8,238) with the 250 method to 89% (7,745) with the 100 method.
  - Correspondingly, the 100 method identified higher proportions of high titer units compared to the 250 method for both platelets (13% vs 9%, p<0.001) and whole bloods (8% vs 4%, p<0.01).
- Overall, the 100 method demonstrated a 4% increase in high titer detection rates, resulting in approximately 3 of every 25 units being high titer.

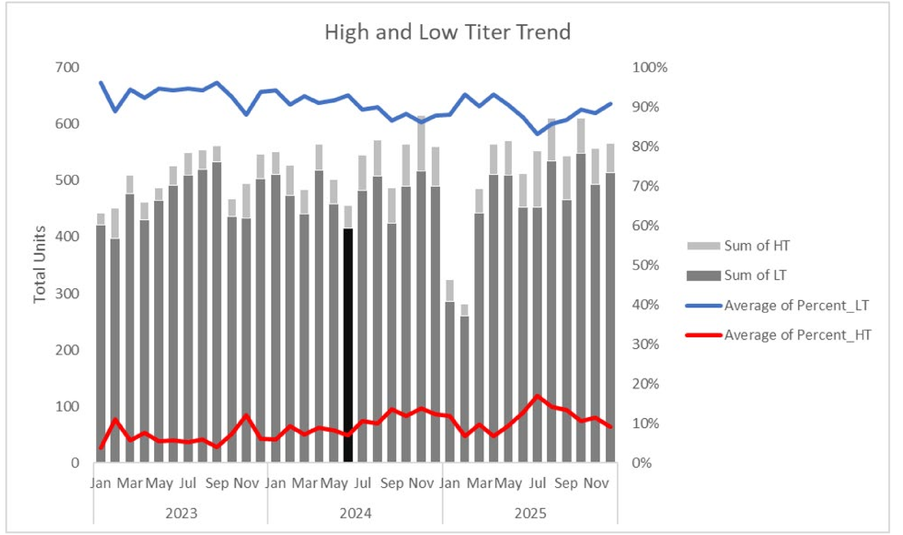


Figure A. High and low titer volume with average percent high and low titer trend. Method of testing switched in June 2024 (highlighted in black).

CONCLUSIONS

- The 100 method identified a higher proportion of high titer platelet and whole blood donations compared to the 250 method.
- Both dilution factor and incubation changed simultaneously, the effects cannot be separated.

Impact
- Increased detection of high titer units may improve transfusion safety but could also reduce the availability of low titer units needed for emergency or ABO mismatched transfusion needs.
- Continued monitoring of isoagglutination titer trends may support future inventory planning and donor recruitment strategies.

ACKNOWLEDGEMENTS

We acknowledge the contributions of the Innovative Blood Resources Immunohematology Reference Laboratory team, whose technical expertise in testing and collection of data were instrumental to the completion of this work.