Evaluation of the Galileo Echo™ Automated Blood Bank Instrument for Pre-transfusion Testing

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Background

Willis-Knighton Health System (WKHS) is a 900+ bed healthcare system consisting of Willis-Knighton Medical Center (WKMC) and 3 satellite facilities; WK Pierremont Health Center (WKP), Willis-Knighton South (WKS) and WK Bossier Health Center (WKB).

Prior to implementation of the Galileo Echo™ (ImmucorGamma, Inc. Norcross, GA), Gel Test™ method (Ortho-Clinical Diagnostics, Raritan, NJ) was utilized for antibody screens at all three satellite facilities while antibody screens were done at WKMC using tube LISS method (Panoscreen®, ImmucorGamma, Inc. Norcross, GA). Tube hemagglutination was used at all 4 sites for ABO/Rh testing. Weak D testing was performed at all 4 sites using tube method.

At the satellite facilities, all positive screens are referred to a local reference lab for antibody identification (ID). At WKMC and at the local reference lab, antibody ID is performed using tube LISS method (Panocell®, ImmucorGamma, Inc. Norcross, GA).

The main goal when considering blood bank automation and the Galileo Echo was standardization across WKHS for pre-transfusion testing. The Galileo Echo would also allow for more antibody identification workups to be done in-house, resulting in lower reference laboratory costs. As a laboratory system which depends largely on "generalist" technologists, blood bank automation would allow routine pre-transfusion testing to be more seamlessly integrated into our laboratory workflow.

Method

The Galileo Echo uses the solid-phase RBC adherence assay (SPRCA) method for the indirect antiglobulin test to detect and identify RBC antibodies. Studies have shown that antibody screen testing using SPRCA is more sensitive than other methods, including tube LISS.

- 305 ABO/Rh samples were tested in parallel with hemagglutination by tube method.
- 157 Rh negative samples were weak D tested in parallel with tube method.
- 40 antibody screens were tested in parallel with antibody screens by tube LISS method at WKMC (20 positive and 20 negative)
- 162 antibody screens were tested in parallel with gel method at the satellite facilities (60 positive and 102 negative)
- 94 antibody IDs were tested in parallel with tube LISS method.

Results

- 99.0% (302/305) concordance was observed among ABO/Rh samples tested in parallel with tube hemagglutination method. Three samples gave NTD (No Type Determined) results on the Galileo Echo.
- 100% concordance (157/157) between weak D testing tested on the Galileo Echo and using tube method.
- 95.0% concordance (38/40) among the antibody screens tested in parallel with tube LISS method at WKMC. (Table 1)

Table 1: Antibody screen results - Galileo Echo vs. Tube-LISS

	Galileo Echo-positive	Galileo Echo-negative
Tube-LISS Positive	19	1**
Tube-LISS Negative	1*	19

* anti-Jk[a] identified
** anti-M identified

- 98.8% concordance (160/162) was observed among the antibody screens tested in parallel with gel method at the satellite facilities. (Table 2)

Table 2: Antibody screen results - ECHO vs. Gel

	Galileo Echo-positive	Galileo Echo-negative
Gel-Positive	161	1†
Gel-Negative	1‡	161

† cold autoantibody detected
‡ anti-E identified

- 90.4% concordance (85/94) observed among antibody IDs tested in parallel between the Galileo Echo and Tube-LISS method (Table 3 and Table 4)

Table 3: Antibody identification results

	Galileo Echo	Tube-LISS
Identical antibodies	85	85
ECHO only	2	0
tube-LISS only	0	6

Table 4: Discordant antibody identification results

Galileo Echo	Tube-LISS
Nonspecific reactivity***	anti-E, Cold Autoantibody
Nonspecific reactivity[?]	anti-K
Nonspecific reactivity	anti-M
Nonspecific reactivity	anti-M
Nonspecific reactivity	anti-M
Panagglutinin	anti-S
Panagglutinin	None Detected
anti-Jk[a]	Negative
anti-E	Negative[¥]

represents 9.6% (9/94) of antibody identification samples compared

*** Reactive with all E positive cells and 3 Enegative cells
[?] Did not react with 1 K+k+ cell
[¥] Also negative with Gel method

Galileo Echo image courtesy of Immucor, Inc. ©2009

Conclusion

The Galileo Echo automated blood bank analyzer has performed consistently and is a welcome addition to our lab for pre-transfusion testing. We have achieved our main objective, which was pre-transfusion testing standardization across WKHS. As for our goal to decrease the number of antibody identification workups which are referred out, we are currently still evaluating and validating the Galileo Echo for antibody identification, but the data collected so far has been promising.

References

ImmucorGamma Galileo Echo Operator Manual, ©2007
ImmucorGamma Galileo Echo Validation Guide, ©2007

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