

Detection sensitivity of red cell alloantibodies using microtube column agglutination systems

Takako Ono, Rie Hikichi, Kinuyo Kawabata, Hitoshi Ohto

To the Editors,

Automation is gaining favor for pre-transfusion testing to improve efficiency. Since microtube column agglutination systems were introduced, they have been compared with tube methods for detection of alloantibodies. These reports indicate that gel column systems are similar to tube polyethylene glycol (PEG)-indirect antiglobulin (IAT) in detecting clinically significant antibodies [1]. Moreover, Weisbach et al. showed that the sensitivity of a number of microtube column system in the detection of clinically significant antibodies was similar, even superior, to that of tube low ionic strength solution (LISS)-IAT [2]. In contrast, gel techniques have been reported to be less sensitive than tube techniques in the detection of anti-Fy^b, anti-Jk^a, anti-S [3], and anti-E [4]. These differences might be affected by the kind of column used and, for tube methods, the enhancement medium.

We compared a gel column method (WADiana Compact, Grifols International, Spain) against manual PEG-IAT [5], for detection of red cell alloantibodies. We paralleled screening results prospectively between November and December 2012 on 270 samples and serial dilutions of 11 samples with known red cell alloantibodies were compared for antibody reactivity by AABB score.

The results of screening show a concordance rate of 97.8% (5 samples both positive, 259 samples both negative) and discordance in 6 samples: 1 sample showed

anti-M cold reactive specificity by gel column that was negative by tube PEG-IAT; 5 samples included 2 anti-E and 1 each anti-Fy^b, -Jk^a, -Le^a by tube PEG-IAT that were negative by gel column. These 5 samples with weak reactivity in tubes were from 4 patients (two anti-E were obtained from same patient on different days).

Titration studies showed overall higher AABB scores by tube PEG-IAT compared with gel column. In particular, anti-Fy^b, -C were only detected in tube PEG-IAT, but anti-M with weak reactivity was only detected by gel column (Figure 1).

In summary, gel column methods compared to tube methods using PEG have limitations in detecting alloantibodies that are weakly reactivity by tubes, but clinically significant. Automated systems can prevent human errors and they streamline and standardize pre-transfusion testing, especially in multi-purpose laboratories. Still, we should note that some alloantibodies with weak reactivity by tube PEG-IAT may be missed by gel column methods, and entertain a potential increase of delayed hemolytic transfusion reactions.

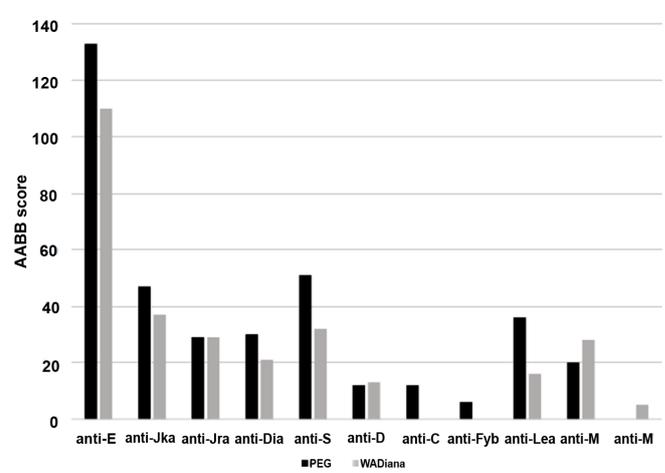


Figure 1: Titration Studies.

Takako Ono¹, Rie Hikichi¹, Kinuyo Kawabata¹, Hitoshi Ohto¹

Affiliations: ¹Department of Blood Transfusion and Transplantation Immunology, Fukushima Medical University.

Corresponding Author: Takako Ono, MT, Department of Blood Transfusion and Transplantation Immunology, Fukushima Medical University; E-mail: taka-ono@fmu.ac.jp

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Takako Ono – Acquisition of data, Analysis and interpretation of data, Drafting the article, Revising it critically for important intellectual content, Final approval of the version to be published

Rie Hikichi – Analysis and interpretation of data, Revising it critically for important intellectual content, Final approval of the version to be published

Kinuyo Kawabata – Analysis and interpretation of data, Revising it critically for important intellectual content, Final approval of the version to be published

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The corresponding author is the guarantor of submission.

Conflict of Interest

Authors declare no conflict of interest.

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