**Comparison of 0.8% vs 3.0% Screening Cells for Antibody Detection and Identification**

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**INTRODUCTION**

Pre-transfusion testing is a vital step prior to the transfusion of fresh blood products in both acute and chronic settings. The determination of the compatibility of fresh blood products for transfusion relies on fulfilling several key criteria, including antibody screening.

Antibody detection and identification in routine hospital transfusion laboratories requires methods that are both rapid and sensitive. The NPAAC Requirements for Transfusion Laboratory Practice (2008) stipulate that the screening cells used to detect unexpected red cell antibodies in pretransfusion testing must express the following antigens: C, c, D, E, e, M, N, S, s, K, k, Fy(a), Fy(b), Jk(a), Jk(b) and Le(a), with the following phenotypes represented: R1R1, R2R2, Jk(a+b-), Jk(a-b+), Fy(a+b-), Fy(a-b+), SS and ss.

Various methods may be used in performing the Indirect Antiglobulin Test (IAT). The two methods implemented in the study use a 3% or 0.8% cell suspension, with a L I S S additive and L I S S suspended red cell suspension respectively.

Most manual tube tests are performed using the LISS additive method, utilising a 3% cell suspension. The LISS additive method does not require the need for the pipetting of very precise volumes.

The introduction of automated column agglutination technology (CAT) facilitates high throughput, rapid processing, is a sensitive technique and provides an operator independent platform. This improves the consistency and reproducibility of results. The CAT used on a fully automated random access instrument will require different incubation times than when performed manually, subsequently there may be a difference in sensitivity with regards to the detection and elucidation of red cell antibodies arising from these different methodologies.

**STUDY AIM**

Evaluation of 0.8% and 3% red cell suspension for pre-transfusion testing using automated CAT AutoVue Innova instrument. A single commercial supplier of screening and panel cells was used. The performance of both 0.8% and 3% red cell suspensions was compared in our study.

**MATERIALS & METHODS**

The study was performed utilising an AutoVue Innova instrument, Ortho Clinical Diagnostics (OCD). Patient samples were collected into EDTA, as per the routine RMH Pretransfusion testing protocol.

CSL Abtectcell™ III 0.8% and 3% and Phenocell™ 0.8% and 3% (B Panel) were used for antibody detection and antibody identification respectively. Abtectcell™ & Phenocell™ batches were paired so cell antigens on the 0.8% and 3% screening cells and extended panels were identical and meeting the NPAAC requirements.

Performance of the IAT on the Innova utilised BioVue Poly cards (IgG / C3d), OCD BLISS (LISS additive) was used with the 3% cell suspensions. De-identified routine patient samples were used in this study; there was no deviation from routine testing. Samples were tested as soon as practical after routine testing had been performed (i.e. within 24 hours from collection). Four frozen plasma samples, known to contain identifiable antibodies were also used due to insufficient plasma, and numbers of particular antibody specificities to be tested and compared.

All samples included in the study were tested with 0.8% and 3% cell suspended panels. Evaluation of all the antibody identifications were performed by only senior staff.

**RESULTS**

A total of 551 samples were tested in the period of evaluation. 513 samples were found to be negative in both 0.8% and 3.0% methods, using Abtectcell™ III Screening Cells. 34 samples were found to be antibody screen positive against 0.8% and 3.0% Abtectcell™ III Screening Cells and subsequently the antibodies (total 38) were identified utilising the Phenocell™ 0.8% and 3% (B Panel). The strength of reactions (score) was in general stronger (higher score) with 0.8% cells. The specificity of the antibodies that showed a significant difference in reaction score were E, Jk(a) & Fy(a).

The antibodies indentified from the 38 positive samples were of the following specificities:

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<th>K</th>
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**CONCLUSION**

The evaluation of 0.8% vs 3.0% CSL Abtectcell™ III Screening Cells and CSL Phenocell™ (B Panel) on the AutoVue Innova platform in our laboratory has shown increased sensitivity using the 0.8% cell suspensions, when compared to using the 3% screening cells. The pattern was observed with single and double antigen red cells as both increased reaction scores and overall reaction strengths. This increase in the sensitivity of identification of many significant red cell antibody specificities is relevant in our tertiary teaching hospital clinical setting.

Patients that have ongoing transfusion requirements will benefit in the selection of phenotyped units of “better fit”, due to enhanced antibody detection and specification using the 0.8% cell suspensions.

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