Validation of DTT treated RBCs to resolve daratumumab interference in antibody screening using Ortho BioVue Cassettes

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Introduktion

Daratumumab (DARA), a monoclonal antibody targeting CD38, is used to treat Multiple Myeloma. It interferes with serological antibody testing, hindering the detection of clinically significant alloantibodies before blood transfusion. The interference is resolved using dithiothreitol (DTT)-treated reagent red blood cells (RBCs), validated for Column Agglutination Technology (CAT) with BioRads Coombs anti-IgG ID Cards (Bio-Rad Laboratories) and traditional tube testing.

The current standard method of DTT-treatment of reagent RBCs by the Association for the Advancement of Blood and Biotherapies (AABB) has been shown to be ineffective in completely eliminating false positive results in the CAT Ortho Bio Vue cassettes (Ortho Clinical Diagnostics).

We have used a modified DTT treatment protocol to eliminate DARA interference, using a 0.2 M DTT solution with an RBC:DTT ratio of 30:25, as opposed to the 1:4 ratio recommended by the AABB technical manual.
Aim:

- To validate the using of Ortho Bio Vue cassettes with DTT-treated reagent RBCs for antibody screening.

Materialer og Metoder

DTT treatment of reagent RBCs was performed with 0.2 M DTT. Antibody screening tests, utilizing DTT-treated RBCs, were conducted using CAT with Bio Rad Cards and BioVue Cassettes, and were carried out on plasma samples from 90 patients undergoing treatment with DARA. Additionally, antibody screening was performed on 10 plasma samples with DARA, each spiked with a single clinically significant alloantibody (anti-D, anti-C, anti-E, anti-cw, anti-M, anti-S, anti-Fya, anti-Fyb, anti-Jka and anti-K). The BioRad cards were manually analyzed, while the Ortho BioVue cassettes were automatically processed using the Ortho Vision Swift Analyzer.

Resultater

The DARA interference was eliminated in all 90 samples from DARA-treated patients in both BioVue cassettes and Bio Rad gel cards. All alloantibodies were detected except for the sample with anti-K.

Diskussion

The study demonstrates that lowering the DTT concentration makes the antibody screening process in BioVue cassettes comparable with Bio Rad cards, including making the detection of allo antibodies, previously masked by DARA interference, reliable.

Konklusion

DTT-treated RBCs can be used to perform automated antibody screening using Ortho BioVue Cassettes in Ortho Vision Swift Analyzer.