OVERCOMING THE INTERFERENCE OF DARATUMUMAB WITH IMMUNOFIXATION ELECTROPHORESIS (IFE) USING AN INDUSTRY-DEVELOPED DIRA TEST: HYDRASHIFT 2/4 DARATUMUMAB


1Biochemistry Laboratory, University Hospital of Nantes, Nantes, France; 2Janssen Diagnostics, Janssen R&D, Raritan, NJ, USA; 3Oncology Research, Janssen R&D, Spring House, PA, USA; 4Sebia, Lisses, France; 5Clinic of Hematology, University Hospital of Nantes, Nantes, France.

BACKGROUND

Detection and quantification of monoclonal component (M-spike) by serum protein electrophoresis (SPE) and immunofixation electrophoresis (IFE) are essential for response evaluation in multiple myeloma (MM). Recent clinical trials of daratumumab, an IgG kappa anti-CD38 monoclonal antibody, have shown impressive results with deep responses. However, daratumumab may be detected on SPE and IFE assays that are used for monitoring disease monoclonal immunoglobulins (M protein).

This can lead to false-positive SPE and IFE assay results for patients with IgG MM and may impact initial assessment of complete responses (CRs) by International Myeloma Working Group criteria.

OBJECTIVE

The aim of this study was to evaluate the HYDRASHIFT 2/4 daratumumab in comparison with our laboratory-developed DIRA test for the displacement of daratumumab on IFE.

PATIENTS AND METHODS

The HYDRASHIFT 2/4 daratumumab assay was prepared by Sebia using the anti-daratumumab antibody that was manufactured under ISO13485 conditions by Janssen and was modified to allow migration of the daratumumab/anti-daratumumab (dana/anti-dana) complex toward the α-globulin fraction on IFE. Daratumumab

RESULTS

COMPARISON WITH THE ORIGINAL DIRA

The HYDRASHIFT 2/4 daratumumab assay showed 100% concordance with the laboratory-developed test on the 51 samples tested (ie, 28 negative DIRA, 14 positive DIRA, and 9 doubtful DIRA).

SENSITIVITY

Dar/anti-dara complexes were detected in the α-globulin fraction with a sensitivity of 200 mg/L.

SPECIFICITY

For 48 samples tested on diagnosis, the anti-daratumumab antibody specifically shifted daratumumab with no effect on the patients’ M-spike (100% specificity).

VERSUS ORIGINAL DIRA:

HYDRASHIFT 2/4 DARATUMUMAB

WHEN IS DIRA REQUIRED?

Only for patients with an IgG kappa MM or kappa LCMM with a co-migrating M-component (occurring in ~20% of cases):

Advantages

• Standardized and automated test
• Excellent concordance with original DIRA
• Migration of complexes away from the gamma globulin fraction

Limits

• Sensitivity for the daratumumab/anti-daratumumab complex detection at serum concentrations <200 mg/L

CONCLUSION

With the growing application of monoclonal antibodies, such as daratumumab, in the treatment of MM, the development of widely available, validated assays to overcome antibody interference will become increasingly important. The HYDRASHIFT 2/4 daratumumab test provides the opportunity to standardize and automate the displacement of daratumumab interference and help with the correct interpretation of IFE results for clinical outcomes.

References:


Conflict of Interest Disclosures:

H. Caillon: Janssen and Sebia (consultant).
A. Irimia: Janssen and Sebia (consultant).
J.S. Simon: Janssen Diagnostics, Janssen R&D, Raritan, NJ, USA.
A. Axel: Janssen R&D, Spring House, PA, USA.
A.K. Sasser: Janssen R&D, Spring House, PA, USA.
M.J. Scullion: Janssen, Spring House, PA, USA.
T. Ligneul: Sebia, Lisses, France.
G. Nouadje: Sebia, Lisses, France.
P. Moreau: Lisses, France.
T. Dejoie: University of Nantes, Nantes, France.

Presented at IFCC-EFLM EuroMedLab; Athens, Greece; 11-15 June 2017. Poster: M034