Infliximab and Antibodies to Infliximab Quantitation

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Infliximab is a chimeric immunoglobulin (IgG1 kappa) that targets tumor necrosis factor alpha (TNF-α) and is currently FDA approved for the treatment of multiple inflammatory conditions.[1] The commercial reference product for infliximab is Remicade. FDA-approved infliximab biosimilar products include Renflexis, Inflectra, Ixifi, and Avsola.[2]

This assay is specifically designed to quantify the concentrations of infliximab and antibodies to infliximab in human serum using an electrochemiluminescence immunoassay method on the MesoScale Discovery platform. The assay can also be used for all approved infliximab biosimilar products.

Featured ARUP Testing

Infliximab and Antibodies to Infliximab Quantitation 3016779

Method: Quantitative Electrochemiluminescence Immunoassay (ECLIA) with Acid Dissociation

Use for the evaluation of patients who are undergoing infliximab or biosimilar therapy.

Clinical Overview

Circulating levels of infliximab have been found to vary significantly between patients. This variation is influenced by physiological characteristics including age, sex, body mass index, and the presence of antibodies against infliximab.[3] Antibodies to infliximab can inhibit the binding of infliximab to TNF-α or increase the clearance of the drug, resulting in a loss of drug efficacy.[4]

Patients treated with TNF-α antagonists, including infliximab, can experience primary or secondary treatment failure. Primary treatment failure occurs early in the treatment course when the disease does not respond to initial induction therapy. Secondary treatment failure occurs when the disease initially responds to treatment but there is subsequent loss of therapeutic effect, leading to disease flares during the maintenance phase. In general, primary failure rates of TNF-α antagonists can be as high as 30-40%.[5,6] Up to 50% of patients who initially respond to therapy may experience a secondary loss of response within a year of treatment.[5,6]

Primary treatment failures can be attributed to pharmacokinetic issues, as well as poor adherence to the treatment regimen. Secondary treatment failures are primarily caused by the development of antibodies to the TNF-α antagonist. Because these scenarios cannot be discerned clinically, it is crucial to perform clinical laboratory monitoring to detect and quantify antidrug antibodies and concomitant drug levels.[7,8,9] This helps determine whether the patient will benefit from additional drug therapy or if switching to a different TNF-α antagonist or a drug from a different class would be beneficial.

Measurement of infliximab and antibodies to infliximab concentrations should be performed at trough (the time immediately prior to the next scheduled infusion).

For more information about laboratory testing for infliximab and other monoclonal antibody drugs, refer to the ARUP Consult Laboratory Testing for Monoclonal Antibody Therapeutics topic.

Test Interpretation

Infliximab and Antibodies to Infliximab Quantitation: Results Interpretation

Test Component	LOQ	Results	Interpretation
Infliximab quantitation	0.5 µg/mL	≥0.5 µg/mL	Infliximab or infliximab biosimilar detected Therapeutic level may vary depending on the disease being treated
		<0.5 µg/mL	Infliximab or infliximab biosimilar not detected
Antibodies to infliximab quantitation	20 ng/mL	≥20 ng/mL	Antibodies against infliximab or an infliximab biosimilar detected Interpret in the context of infliximab or infliximab biosimilar trough concentration to determine clinical significance and impact on treatment efficacy

Test Component	LOQ	Results	Interpretation
		<20 ng/mL	Antibodies against infliximab or an infliximab biosimilar not detected

LOQ, limit of quantitation

Limitations

- This test does not differentiate between infliximab and the various infliximab biosimilar products.
- This assay is subject to biotin (also known as vitamin B7) interference.
  - Serum samples from patients who are taking biotin (eg, as a dietary supplement) may contain elevated concentrations of biotin.
  - Elevated serum biotin concentrations may affect the accuracy of infliximab and anti-infliximab antibody measurements.
- The presence of endogenous infliximab in serum samples can interfere with most antibody assays.
  - To mitigate this interference, this assay includes an acid dissociation step that helps reduce the impact of endogenous infliximab.
  - The actual tolerance for endogenous infliximab may vary depending on the specific concentration of the antibody to infliximab present in the sample.

References

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