MAYO CLINIC LABORATORIES

Test Definition: TAMIK

Amikacin, Trough, S

Overview

Useful For
Monitoring adequate clearance of amikacin near the end of a dosing cycle

Method Name
Kinetic Interaction of Microparticles in Solution (KIMS)

NY State Available
Yes

Specimen

Specimen Type
Serum

Specimen Required
Container/Tube:

Preferred: Serum gel

Acceptable: Red top

Specimen Volume: 0.5 mL

Collection Instructions:

1. Serum gel tubes should be centrifuged within 2 hours of collection.

2. Red-top tubes should be centrifuged and aliquoted within 2 hours of collection.

Forms
If not ordering electronically, complete, print, and send a Therapeutics Test Request (T831) with the specimen.

Reject Due To

Gross hemolysis	Reject

Specimen Minimum Volume

0.25 mL

Specimen Stability Information

Specimen Type	Temperature	Time	Special Container
Serum	Refrigerated (preferred)	14 days	
	Frozen	28 days	
	Ambient		

Clinical & Interpretive

Clinical Information

Amikacin is an aminoglycoside used to treat severe blood infections by susceptible strains of gram-negative bacteria. Aminoglycosides induce bacterial death by irreversibly binding bacterial ribosomes to inhibit protein synthesis. Amikacin is minimally absorbed from the gastrointestinal tract, and thus can been used orally to reduce intestinal flora.

Peak serum concentrations are seen 30 minutes after intravenous infusion, or 60 minutes after intramuscular administration. Serum half-lives in patients with normal renal function are 2 to 3 hours.

Excretion of aminoglycosides is principally renal, and all aminoglycosides may accumulate in the kidney at 50 to 100 times the serum concentration.

Toxicity can present as dizziness, vertigo, or, if severe, ataxia and a Meniere disease-like syndrome. Auditory toxicity may be manifested by simple tinnitus or any degree of hearing loss, which may be temporary or permanent, and can extend to total irreversible deafness. Nephrotoxicity is most frequently manifested by transient proteinuria or azotemia, which may occasionally be severe. Aminoglycosides also are associated with variable degrees of neuromuscular blockade leading to apnea.

Reference Values

Trough: <8.0 mcg/mL

Toxic trough: >10.0 mcg/mL

Interpretation

For conventional (nonpulse) dosing protocols, trough concentrations should fall to <8.0 mcg/mL. Toxicity may occur if the trough serum concentration is maintained >10.0 mcg/mL for prolonged periods of time.

Cautions

Aminoglycosides are excreted primarily by glomerular filtration, thus, the serum half-life will be prolonged and significant accumulation will occur in patients with impaired renal function.

Clinical Reference

1. Wilson JW, Estes LL: Mayo Clinic Antimicrobial Therapy Quick Guide, 2008

2. Hammett-Stabler CA, Johns T: Laboratory guidelines for monitoring of antimicrobial drugs. National Academy of Clinical Biochemistry.. Clin Chem 1998 May;44(5):1129-1140

3. Gonzalez LS III, Spencer JP: Aminoglcosides: a practical review. Am Fam Physician 1998 Nov 15;58(8):1811-1820

Performance

Method Description

Kinetic interaction of microparticles in solution (KIMS) as measured by changes in light transmission.

The assay is a homogeneous immunoassay based on the principle of measuring changes in scattered light or absorbance which result when activated microparticles aggregate. The microparticles are coated with amikacin and rapidly aggregate in the presence of an amikacin antibody solution. When a sample containing amikacin is introduced, the aggregation reaction is partially inhibited, slowing the rate of the aggregation process. Antibody bound to sample drug is no longer available to promote microparticle aggregation, and subsequent particle lattice formation is inhibited. Thus, a classic inhibition curve with respect to amikacin concentration is obtained, with the maximum rate of aggregation at the lowest amikacin concentration. By monitoring the change in scattered light or absorbance, a concentration-dependent curve is obtained.(Package insert: Roche Amikacin reagent, Roche Diagnostic Corp, Indianapolis, IN)

PDF Report

No

Specimen Retention Time

1 week

Performing Laboratory Location

Rochester

Fees & Codes

Test Classification

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This test has been cleared, approved, or is exempt by the US Food and Drug Administration and is used per manufacturer's instructions. Performance characteristics were verified by Mayo Clinic in a manner consistent with CLIA requirements.

CPT Code Information

80150

LOINC® Information

Test ID	Test Order Name	Order LOINC Value
TAMIK	Amikacin, Trough, S	3321-7

Result ID	Reporting Name	LOINC®
TAMIK	Amikacin, Trough, S	3321-7