MAYO CLINIC LABORATORIES

Test Definition: BRIVA

Brivaracetam, Plasma

Overview

Useful For
Assessing compliance and toxicity for brivaracetam

Method Name
Liquid Chromatography-Tandem Mass Spectrometry (LC-MS/MS)

NY State Available
Yes

Specimen

Specimen Type
Plasma EDTA

Specimen Required
Supplies: Sarstedt Aliquot Tube 5 mL (T914)
Collection Container/Tube:
Preferred: Lavender top (K2 EDTA)
Acceptable: Lavender top (K3 EDTA), green top (sodium or lithium heparin), light-blue top (sodium citrate)
Submission Container/Tube: Plastic vial
Specimen Volume: 1 mL
Collection Instructions:
1. Draw blood immediately before next scheduled dose.
2. **For sustained-release formulations only**, draw blood a minimum of 12 hours after last dose.
3. Within 2 hours of collection, centrifuge and aliquot plasma into a plastic vial.

Forms
If not ordering electronically, complete, print, and send 1 of the following forms with the specimen:
-Neurology Specialty Testing Client Test Request (T732)
-Therapeutics Test Request (T831)

Specimen Minimum Volume
0.5 mL

Reject Due To

Gross hemolysis	OK
Gross lipemia	OK
Gross icterus	OK

Specimen Stability Information

Specimen Type	Temperature	Time	Special Container
Plasma EDTA	Refrigerated (preferred)	28 days	
	Ambient	28 days	
	Frozen	28 days	

Clinical & Interpretive

Clinical Information

Brivaracetam is a newer antiepileptic drug, an analogue of levetiracetam, that is used as therapy for partial onset seizures in patients one month or older. It is available in both an oral and intravenous solution and oral tablet. When taken orally, it is rapidly and completely absorbed. It is primarily excreted through the renal system and has an elimination half-life of approximately nine hours. While the exact mechanism for brivaracetam's anticonvulsive effects is unknown, it has a high and selective binding affinity for synaptic vesicle protein 2A in the brain. The drug has a narrow therapeutic range and a wide interindividual variability in rate of elimination.

Adults and children 16 years and older typically take 25 mg twice daily up to 100 mg twice daily. Trough therapeutic reference ranges in plasma have been reported between 0.5 to 0.9 mcg/mL (mg/L) with toxicity more common above 1.8 mcg/mL. The most common adverse effects include somnolence/sedation, dizziness, fatigue, and nausea/vomiting. Vertigo, balance disorder, fatigue, nausea, diplopia, anxiety, and bradycardia have also been reported following brivaracetam overdose.

Reference Values

0.2-2.0 mcg/mL

Interpretation

The report is intended for use by a physician to determine if the patient is receiving a dose sufficient to achieve a therapeutic effect or to assess whether the patient is compliant with prescribed dose. The reference range represents the concentrations observed to be associated with greatest drug efficacy without side effects or toxicity.

Most individuals display optimal response to brivaracetam with plasma levels 0.2 to 2.0 mcg/mL. Some individuals may respond well outside of this range or may display toxicity within the therapeutic range; thus, interpretation should include clinical evaluation. Toxic levels have not been well established. Therapeutic ranges are based on specimens collected at trough (ie, immediately before the next dose).

Cautions

This test cannot be performed on whole blood.

Clinical Reference

1. Patsalos PN, Spencer EP, Berry DJ. Therapeutic drug monitoring of antiepileptic drugs in epilepsy: A 2018 Update. Ther Drug Monit. 2018;40(5):526-548
2. Aalapati KK., Amit S, Patnaik, RS. Method development and validation of a novel UHPLC coupled with MS/MS system

for the estimation of brivaracetam in human (K2EDTA) plasma samples and its application to pharmacokinetic study. Curr Pharm Anal. 2022;18.5:504-512
3. Hiemke C, Bergemann N, Clement HW, et al. Consensus guidelines for therapeutic drug monitoring in neuropsychopharmacology: Update 2017 [published correction appears in Pharmacopsychiatry. 2018 Jan;51(1-02):e1]. Pharmacopsychiatry. 2018;51(1-02):9-62
4. Khaleghi F, Nemec EC 2nd. Brivaracetam (Briviact): A novel adjunctive therapy for partial-onset seizures. P T. 2017;42(2):92-96
5. Mohamed S, Riva R, Contin M. Development and validation of an UHPLC-MS/MS assay for the therapeutic monitoring of brivaracetam plasma concentrations in patients with epilepsy. Ther Drug Monit. 2020;42(3):445-451

Performance

Method Description
The plasma sample is diluted in an acetonitrile internal standard. The protein precipitate is centrifuged, and a portion of the supernatant is diluted with mobile phase 1 for analysis using liquid chromatography tandem mass spectrometry.(Unpublished Mayo method)

PDF Report
No

Day(s) Performed
Monday through Friday

Report Available
Same day/1 to 2 days

Specimen Retention Time
14 days

Performing Laboratory Location
Mayo Clinic Laboratories - Rochester Superior Drive

Fees & Codes

Fees
- Authorized users can sign in to Test Prices for detailed fee information.
- Clients without access to Test Prices can contact Customer Service 24 hours a day, seven days a week.
- Prospective clients should contact their account representative. For assistance, contact Customer Service.

Test Classification
This test was developed and its performance characteristics determined by Mayo Clinic in a manner consistent with CLIA requirements. It has not been cleared or approved by the US Food and Drug Administration.

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CPT Code Information

80299

LOINC® Information

Test ID	Test Order Name	Order LOINC® Value
BRIVA	Brivaracetam, P	88894-1

Result ID	Test Result Name	Result LOINC® Value
620767	Brivaracetam, P	88894-1