Lacosamide (Vimpat) Drug Monitoring

Indications for Ordering

Optimize drug therapy and monitor patient adherence

Test Description

High performance liquid chromatography coupled with tandem mass spectrometry

Tests to Consider

Lacosamide, Serum or Plasma 2003182

- Predose (trough) concentration at steady state should be assessed

Disease Overview

Clinical issues

Lacosamide is used in the treatment of

- Partial-onset seizures
- Diabetic neuropathic pain

Physiology

- Exact mechanism of action not well known
- Functions by enhancing sodium channel slow inactivation without affecting the fast inactivation mechanism
- Modulates the collapsing response mediator protein-2 (CRMP-2)
  - CRMP-2 is a phosphoprotein involved in neuronal differentiation and modulation of axonal overgrowth
- Net drug result – stabilization of hyperexcitable neuronal membranes and inhibition of repetitive neuronal firing
- Does not bind gamma-aminobutyric acid (GABA) receptors or glutamate targets

Drug profile

- Dose adjustments are recommended for patients with severe kidney impairment
- Lacosamide should not be used in patients with
  - Severe liver impairment
  - Cardiac disease or cardiac conduction abnormalities
    - Drug can cause dose-dependent PR-interval prolongation, increasing risk for atrioventricular block
- Lacosamide use can result in abnormal results for alanine aminotransferase (ALT)

Test Interpretation

Analytical sensitivity – limit of detection is 0.5 µg/mL

- Interferences from commonly used drugs and associated metabolites have not been observed

Results

- Concentration is reported
- Therapeutic and toxic ranges are not well established
  - Proposed range for seizure control is 5.0-10.0 µg/mL using trough draw obtained ≤2 hours before the next dose
  - Approximated dose-related range is 2.5-18.0 µg/mL at doses of 200-600 mg/day
  - Critical values are not defined

Limitations

Lacosamide pharmacokinetics have not been studied in pediatric patients