Lamotrigine (serum)

Pseudonyms - Lamictal

Lamotrigine is a member of the Sodium channel blocking family of anti-epileptics and is also used to treat the depressive phase observed in bipolar disorders. The mechanism of action for the latter is not clear as other Sodium channel blockers are not effective in the treatment of bipolar disorder.
Lamotrigine is thought to inhibit the excitatory neurotransmitters and stabilises neuronal membranes.

Lamotrigine concentrations peak within 2.5 hours and the elimination half life is between 14-103 hours (https://www.toxbase.org). Clearance is affected by other anti-epileptic drugs.
Although routine TDM is not indicated in patients treated with this drug, requests should be made in patients suspected of toxicity or poor compliance. The prevalence of toxicity increases significantly with concentrations above 15mg/l (1). There are large inter-individual differences between the dose/concentration and response.

General information

Collection container:

Serum (Sarstedt Brown top, 4.9ml) 

Lithium heparin plasma (Sarstedt Orange top, 4.9ml or 1.2ml Paed) 

Type and volume of sample:

Serum or plasma 1ml (200µl separated serum/plasma required)

Specimen transport/special precautions:

Samples should be taken immediately pre-dose (trough) where possible and not within 5 days of a dose change.

No special transport arrangements

External Laboratories – send separated serum/plasma via first class post

Laboratory information

Method principle:

HPLC Separation with UV Detection at 215nm

Biological reference range

3.0 – 15 mg/l

Turnaround times:

1 week

Clinical information

Factors known to significantly affect the results:

There are no reported analytical interferents. Occasionally other anti-epileptic drugs may co-elute but HPLC conditions can be manipulated to prevent this.

Clinical decision points:

There is a very poor relationship between concentration and toxicity with toxic effects being reported very close to the reported therapeutic range (2). Results are telephoned above 15mg/l for this reason.

References:

1. An updated Overview on Therapeutic Drug Monitoring of recent Antiepileptic Drugs (Review). Drugs RD (2016) 16; 303-316
2. Therapeutic Drug Monitoring of Lamotrigine: The Annals of Pharmacotherapy (2002) 36; 917-920.

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