Lacosamide: A new antiepileptic drug

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Lacosamide is a new antiepileptic drug approved by US FDA in 2008 as adjuvant therapy for partial onset seizure with or without secondary generalization in patients with epilepsy above 17 years. It is available for oral and intravenous administration.

**Pharmacodynamics:**

Lacosamide, (R) acetamino – N bazyl – 3 - methoxy propronalmid is a new compound specifically synthesized as anticonvulsant drug. Systemic evaluation of several derivatives of this compound in animal models led to the identification of Lacosamide.

Lacosamide have dural mode of action. It selectively enhances slow inactivation of voltage gated sodium channels, resulting in stabilization of hyperexcitable neuronal membranes and inhibition of repetitive neuronal firing, without exhibiting effects on physiological neuronal excitability. Lacosamide also binds to collapsing response mediator protein – 2 (CRMP -2), a phosphoprotein that is expressed mainly in the nervous system. CRMP – 2 is involved in neuronal differentiation and network building and probably also epileptogenesis. The nature of interaction between Lacosamide and CRMP 2 is still not clear in terms of symptomatic or disease modifying effects.

It is absorbed rapidly and completely from the gastrointestinal tract after oral administration with negligible first pain effect and has high oral bioavailability.

Peak plasma concentrate is achieved between 0.5 and 4 hrs following a single dose. It has a linear phasmacokinetics. The elimination half life of Lacosamide is 13 hrs and is stable in repeated administration. It is mainly excreted through kidney. It doesn’t inhibit or induce the cytochrome Puso enzyme activity and has very low protein binding (< 15%) capacity.

It doesn’t affect the plasma levels of other antiepileptic drugs like Carbamazepine, Valproic acid on Lamotrigine, Levetiracetam, Oxcarbazepine or Phenytoin to a relevant extent. It also doesn’t affect the levels of Metformin, Digoxin or Oral contraceptives. Lacosamide solution for infusion (10mg/ml) is isotonic, stable at room temperature, and does not require dilution prior to intravenous administration. Intravenous infusion of Lacosamide at a dose of 200mg over 30 to 60 minutes has shown bioequivalence to oral Lacosamide at the same dose. At a dose of 400mg per day, Lacosamide showed seizure freedom upto 40% which is the maximum recommended dose per day. The efficiency role is 49% when added is 3rd antiepileptic drug in
intractable seizure. The 50% responder site both lacosamide 400mg/day and 600mg/day were statistically significant over placebo, but dose 600mg/day produced more side effects than 400mg/day.

**Side effects:**

Common side effects include nausea, vomiting, dizziness. Serious side effects are ataxia and nystagmus.

**Dosage and administration:**

Oral Lacosamide is available as 50mg, 100mg, 150mg and 200mg tablets. Therapeutic dose are 20-40mg per day. Dosage consists of 50mg twice a day in the first week to be titrated at weekly intervals by 100mg/day up to a maximum of 400mg/day over 4 weeks.

**Conclusion**

Lacosamide is a useful antiepileptic drug in intractable partial onset seizures. Its different mechanism of action from the existing antiepileptic drugs make it advantages to be a good third add on drug in the management of epilepsy. Its much less side effect profile, reduced drug interaction and faster onset of action all makes it a good therapeutic agent in intractable epilepsy.