Carbamazepine (Tegretol)

Carbamazepine (Tegretol) is an anticonvulsant medication that decreases seizure activity caused by high-frequency neuronal discharge. This drug is primarily indicated for seizures but is also used to treat trigeminal neuralgia and symptoms associated with bipolar disorder. Neurological side effects such as blurred vision, vertigo, and headache are common. Severe side effects include Stevens-Johnson Syndrome (SJS), toxic epidermal necrolysis (TEN), hepatotoxicity, and blood dyscrasias such as aplastic anemia. Monitor the patient for signs of water retention. Grapefruit juice increases serum carbamazepine and should be avoided. It is teratogenic and should be avoided in pregnancy.



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Mechanism

Inactivates Na+ Channels
Inactivated Salt-shaker Channel
Carbamazepine binds to sodium channels and prevents the normal action potential activity. This results in prolonged sodium channel inactivity and decreased neuronal excitability that leads to seizure activity. Important to note that carbamazepine induces its own metabolism, and dosage requirements increase with chronic use.

Indications

Seizures
Caesar
Carbamazepine prolongs the inactivation of sodium channels and suppresses high-frequency neuronal discharge that contribute to the development of partial seizures and tonic-clonic seizures. This drug does not help treat absence, myoclonic, or atonic seizures.

Bipolar Disorder
Bi-polar-bear
Patients with bipolar disorder experience alternating episodes of mania and depression. Carbamazepine is an antiepileptic drug used to suppress mania and stabilize mood. Continued use of this medication may prevent recurrent episodes of mania and depression.

Trigeminal Neuralgia
Tri-gem Nerve-algae
Trigeminal neuralgia is a type of chronic neuropathic pain. Although the mechanism remains unknown, carbamazepine decreases neuropathic pain along the trigeminal nerve but is not indicated as an analgesic for other types of pain.

Side Effects

Nystagmus
Nostradamus
Visual disturbances, such as blurred vision, nystagmus, and diplopia are common neurologic effects seen in patients given carbamazepine. Tolerance to these side effects develops with continued use of the drug.

Ataxia
A-taxi
Neurological effects such as ataxia, vertigo, and headache are commonly seen within the first few weeks of carbamazepine therapy. Minimize these side effects by initiating medication therapy in low doses and administering the largest dose at bedtime.

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Hepatotoxicity

Liver with Toxic-green-glow

Carbamazepine increases the number of drug-metabolizing enzymes found in the liver. A dysfunctional liver may lead to liver damage and result in hepatotoxicity and hepatitis. Periodically obtain liver function tests and inform the patient to contact the physician if experiencing symptoms of liver damage (i.e., dark-colored urine, clay-colored stools, jaundice, rash, etc.). Use caution if this medication is taken alongside haloperidol and clozapine as plasma levels in these medications may be reduced.

Blood Dyscrasias

Blood-cell Disc-razor

Carbamazepine may lead to bone marrow suppression and result in blood dyscrasias, such as agranulocytosis and fatal aplastic anemia. Obtain a complete blood count before initiating carbamazepine therapy and periodically afterwards. Do not administer this drug to patients with pre-existing hematologic abnormalities. Instruct the patient to notify the physician if experiencing symptoms of blood dyscrasias (i.e., fever, pallor, weakness, easy bruising, petechiae, etc.)

Water Retention

Water Retained

Carbamazepine increases the secretion of antidiuretic hormone and inhibits renal excretion of water. This leads to water retention and decreased blood osmolarity. Increased water retention may be detrimental to patients with heart failure. Periodically monitor the patient's serum sodium level.

Stevens-Johnson Syndrome

Steve-Johns

Carbamazepine may lead to dermatologic issues including rash, Stevens-Johnson syndrome (SJS), and toxic epidermal necrolysis (TEN). A genetic variation primarily found in patients of Asian descent have an increased susceptibility of developing SJS or TEN while taking carbamazepine. Anti-inflammatory medications or antihistamines may be given to treat mild rashes. Patients experiencing SJS or TEN should immediately stop carbamazepine treatment.

Considerations

Avoid Grapefruit Juice

Avoid-sign at Grapefruit Juice

Since grapefruit juice prevents normal drug metabolism and increases serum levels, do not administer carbamazepine with grapefruit juice. Grapefruit juice increases the amount of carbamazepine to toxic plasma levels.

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