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The Bulletin from the Clinical Pharmacist

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Edaravone

Overview:

Edaravone is classified as a free radical scavenger and antioxidant, approved for amyotrophic lateral sclerosis (ALS). It was first approved in Japan in 2001 for treating acute ischemic stroke, and later for amyotrophic lateral sclerosis (ALS) in 2015. In India, the exact approval date for Edaravone isn't specified.

Therapeutic Indication

Edaravone is indicated for the improvement of neurological symptoms, and slow the progression of neurologic deficits associated with amyotrophic lateral sclerosis (ALS)

Mechanism of Action:

Edaravone's main mechanism in ALS is as a potent free radical scavenger, neutralizing harmful reactive oxygen species (ROS) like hydroxyl and peroxynitrite radicals that cause oxidative stress, damaging motor neurons. By donating an electron, it inhibits lipid peroxidation and oxidative damage, protecting cells, slowing neuronal death, and potentially activating neuroprotective pathways like GDNF/RET (Glial Cell Line-Derived Neurotrophic Factor)/ (Rearranged During Transfection) signaling, thereby slowing disease progression

Dosing & recommendations:

Indication	Dose	Dilution	ROA	Duration
ALS	60 mg OD	Diluted with saline, administered over 60 minute	IV only; avoid saccharide-containing infusion fluids and total parenteral nutrition preparations.	• Initial treatment cycle: daily dosing for 14 days followed by a 14- day drug-free period • Subsequent treatment cycles: daily dosing for 10 days out of 14- day periods, followed by 14-day drug-free periods

Note:

This is a chronic disease which does not get cured. Treatment may modify the course/ duration or severity. It ends in death sooner or later. Treatment should be taken at the end of the Patient death.

Role of Edaravone as a Treatment Option for Patients with Amyotrophic Lateral Sclerosis

Amyotrophic Lateral Sclerosis (ALS), also known as Lou Gehrig's disease, is a progressive and fatal neurodegenerative disease that leads to a loss of muscle control due to nerve cells being affected in the brain and spinal cord. Some of the common clinical presentations of ALS include weakness of muscles, changes in behavior, dysfunction in speech, and cognitive difficulties. The cause of ALS is uncertain. The goal of this stem cell therapy was to employ stem cells and generate motor neurons to replenish the lost ones in ALS patients.

More recently, only one drug was approved by the FDA for the treatment of ALS: edaravone. Other non-pharmacological therapies, such as stem cell therapy, have been proven to be well-tolerated and safe in ALS patients, but more research should be done regarding the safety and efficacy of those therapies alone or their usage in combination with other treatments.

Monitoring:

Dosing adjustment for edaravone is not needed for either hepatic or renal impairment. As edaravone contains sodium bisulfite, it is important to check whether the patient is allergic prior to the administration of edaravone

Therapeutic Response of Edaravone and Riluzole as a Combination Therapy in ALS Patients

Edaravone is safe and slows the progression of disease when combined with riluzole, although the effects are temporary. Combination therapy works better for bulbar symptoms. Serum creatinine is useful for tracking the course of a disease. Real-world studies' survival rates indicate that Edaravone (often in combination with riluzole) has a lower mortality risk. Provides more protection, and while safety monitoring is still crucial, edaravone might increase the effects of riluzole.