Safety and Efficacy of Edaravone in Delaying Functional Decline in Amyotrophic Lateral Sclerosis: A Meta-Analysis
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Objective:
This meta-analysis aims to determine the safety and efficacy of edaravone in delaying functional decline among patients with ALS.

Background: Treatment of patients with Amyotrophic Lateral Sclerosis (ALS) remains a challenge for clinicians. The symptoms invariably progress and patients succumb to death few years after diagnosis. To date, only riluzole has shown modest effect in improving survival time by a few months. Alternative treatment options that can alter the clinical course of ALS have remained elusive for the past several years. Studies on novel therapies are warranted based from the emerging molecular discoveries on the pathogenesis of neuronal cell death in ALS.

Design/Methods: A meta-analysis of randomized controlled trials was done using studies from various databases. Search terms “amyotrophic lateral sclerosis” and “edaravone” as well as alternate keywords like “ALS,” “motor neuron disease,” “3-methyl-1-phenyl-2-pyrazolin-5-one,” “MCI-186,” “anti-oxidant,” and “free radical scavenger” were used. Patients 19 years old and above, diagnosed with ALS within 3 years based from the revised El Escorial criteria, and with no compromised respiratory functions were included.

Results: Three studies with a total of 368 ALS patients were included. Patients were given either 60 mg of intravenous edaravone or a matching placebo. Incidence of both non-serious (RR 1.00, CI 0.93, 1.08) and serious adverse events (RR 0.66, CI 0.39, 1.12) are not statistically different between groups. Mortality also did not differ (RR 1.79, CI 0.39, 8.23). All studies are homogenous (I² = 0%). Mean change in ALSFRS-R scores at 24 weeks is higher in the placebo group (MD 1.6, CI 1.44, 1.76) reflecting more functional deterioration. However, the three studies exhibited heterogeneity with an I² of 99%. Sensitivity analysis was done but still yielded a substantial heterogeneity (I²=61%-94%).

Conclusions: Edaravone is safe to use and patients treated with edaravone has less functional decline at 24 weeks compared to those receiving standard of care.