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Adipose-derived stem cell conditioned media extends survival of a mouse model of amyotrophic lateral sclerosis

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There is currently very limited effective pharmacological treatment for amyotrophic lateral sclerosis. Recent evidence suggests that Adipose-derived Stem Cell Conditioned Media (ASC-CM) have strong anti-oxidative and anti-neuronal death properties; thus, the present study tested the effects of ASC-CM in mice expressing a mutant superoxide dismutase ($SOD1^{G93A}$) linked to human amyotrophic lateral sclerosis. Administration of ASC-CM after symptom onset significantly increased the lifespan of $SOD1^{G93A}$mice by approximately 2 weeks, nearly doubling post-onset survival. Moreover, immunohistochemical analysis detected less activation of microglia and astrocytes and higher motor neuron counts at an early symptomatic stage (7 days following onset) in the spinal cords of $SOD1^{G93A}$mice given ASC-CM treatment. Additionally, lower levels of phosphorylated p38, a mitogen-activated protein kinase that is involved in both inflammation and neuronal death, were observed in the spinal cords of $SOD1^{G93A}$ mice treated with ASC-CM for 3 and 7days. These results indicate that ASC-CM may represent a novel and effective therapeutic for the treatment of amyotrophic lateral sclerosis and these significant neuroprotective effects observed in a commonly used amyotrophic lateral sclerosis mouse model validate the therapeutic potential of ASC-CM for slowing disease progression by attenuating the neuroinflammation and motor neuron cell death associated with clinical amyotrophic lateral sclerosis pathology.

Biography

Yansheng Du has completed his Ph.D from Wayne State University School of Medicine and postdoctoral studies from Eli Lilly and Company. He is associate professor in Department of Neurology, Indiana University School of Medicine. He has published more than 70 papers in reputed journals and serving as an editorial board member of repute.

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