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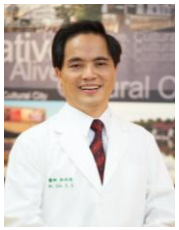

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INTRACEREBRAL IMPLANTATION OF MESENCHYMAL STEM CELL PROLONGS LIFESPAN OF ALS MICE

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Background

Amyotrophic lateral sclerosis (ALS), a progressive fatal neurodegenerative disease, displays loss of motor neurons in the cortex, brainstem and spinal cord. However, there is no efficient cure for this disease. Since mesenchymal stem cells (MSC) derives from bone marrow, muscle, and fat tissue have been used effectively in ALS mice, our study demonstrates that ADSC could prolong the lifespan of ALS mice.

Methods

We use overexpressed human mutated SOD1 protein ALS transgenic mice with G93A mutation [Tg ($SOD1^{G93A}$)]. NSC34 transiently overexpressing mutant $SOD1^{G93A}$ (NSC34-$SOD1^{G93A}$) was used in-vitro study. Animals were randomly distributed into three groups at 60 days of age: (1) untreated, (2) Riluzole-treated group in which the mice were treated with Riluzole at a dosage of 16 mg/kg body weight once daily via intraperitoneal injection; (3) human ADSC treated group, transplanted with ADSC ($2x10^6$ cells/30 µl PBS) via intracerebral injection once at 60 days postnatal, and then transplanted with ADSC ($1x10^6$ cells/150 µl PBS) intravenously at 90 days and 104 days postnatal. After the mice were treated for 30 days, the hind limbs of the mice were examined by BBB scale (Basso, Beattie, and Bresnahan (BBB) Locomotor Rating Scale) wherein a lower scale represents a more severe action disorder in the mice. The BBB scale of the hind limbs of normal mice is 21 points, while the BBB scale of disease-progressed ALS mice decreases from 21 to 0 points. The end-point was determined as the inability of the mouse to roll over within 30 s after being placed on its side (Gurney et al., 1996).