KSN 2018
Seoul, Korea · May 17 - 20

Abstract Type : Poster
Presentation No. : PAK 013

The effect of mesenchymal stem cell-derived exosome on cisplatin-induced acute kidney injury

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Objectives: Acute kidney injury (AKI) is a lethal damage caused by sudden kidney failure which happens within a few hours or days and currently no known cure is available. Although mesenchymal stem cells (MSC)-based therapy has been studied as a potential treatment for AKI, practical application is hampered by time-limited availability of MSC cell therapy. Recently MSC exosomes, nano-sized (30 – 200 nm) vesicles shed by MSC, are emerged as a potential cell-free therapy regime for various human disease. In the present study, we analysed the effect of exosomes derived from human adipose tissue MSC (ASC exosomes) on the cisplatin-induced AKI in rats.

Methods: ASC exosomes were isolated by the proprietary filtration method and characterized as recommended by the International Society for Extracellular Vesicles (ISEV). AKI was induced in Sprague Dawley rats by intraperitoneal administration of 10 mg/kg cisplatin.

Results: ASC exosomes were administered intravenously and the survival of rats was monitored overtime. The level of blood urea nitrogen (BUN) and creatinine (CRE) was also determined. The effects of ASC exosomes were also accessed by histological, western blot and real-time PCR analysis of injured kidney tissues.

Conclusions: The effect of MSC exosomes was evaluated in the Cisplatin-AKI animal model.