COMPARISON OF THE TWO METHODS FOR ISOLATION OF EXOSOMES FROM HUC-MSCS

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Background: The potential of exosomes/extracellular vesicles (EVs) that were isolated from the stem cells are extensively studying in preclinical studies for many kind of diseases. The interest in exosomes consists to their promising therapeutic capabilities for regenerative medicine [1]. This study aimed to study the exosomes that were isolated from human umbilical cord-derived mesenchymal stem cells (hUC-MSCs) using two different methods.

Materials and methods: hUC-MSCs were subcultured for more than 3 weeks and then conditioned medium was collected and saved. Exosomes were isolated from CM using a commercial kit (Total Exosome Isolation Reagent, Invitrogen, USA) and by ultracentrifugation method. Isolated exosomes were measured using ZetaView analyzer and scanning electron microscopy (SEM) method [2,3].

Results: The measurement of the size of the exosomes/EVs that were obtained by commercial kit showed a diameter equal to 177.9 nm and a Zeta potential peak -1.1 mV. The measurement of the size of the exosomes/EVs that were obtained by the ultracentrifugation method showed a diameter 161.4 nm and Zeta potential peak equal to 2 mV. The results of SEM demonstrated exosomes that have a spherical and "cup" shape with a diameter near 30-50 nm.

Conclusion: We obtained exosomes/EVs from the CM of hUC-MSCs. Comparing the use of the commercial method and ultracentrifugation method for the isolation of exosomes/EVs exhibited that sizes were nearly similar but Zeta potential were different. An additional investigation of obtained exosomes/EVs is necessary.

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Keywords: mesenchymal stem cells, exosomes/extracellular vesicles, regenerative medicine.

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