HIGH BLOOD PRESSURE

Motawi, T. M. K., et al. (2018). "Role of mesenchymal stem cells exosomes derived microRNAs; miR-136, miR-494 and miR-495 in pre-eclampsia diagnosis and evaluation." Arch Biochem Biophys 659: 13-21.

BACKGROUND: Pre-eclampsia (PE) is one of the most threatening pregnancy complications. So far neither a secure, competent therapy for PE nor effective biomarkers for a premature discovery has been achieved. However, currently, the use of released microRNAs (miRNAs) as potential biomarkers and therapy targets for various diseases is the dominating area of research. The aim of our study was to identify miRNAs 136, 494 and 495 genes expression in exosomes of peripheral blood compared to umbilical cord mesenchymal stem cells (UCMSCs) conditioned media released exososomes in patients with PE, as valuable markers for PE early prediction. METHODS: Blood samples were collected from 100 patients with PE and 100 control with normal pregnancies. Thirty fresh umbilical cord samples of women with healthy pregnancies (n=15) and PE patients (n=15) were retrieved during caesarean deliveries and UCMSCs were isolated from Wharton jelly. The expression of miRNAs 136, 494 and 495 in exosomes of peripheral blood and UCMSCs conditioned media was measured using quantitative real-time PCR method. Unpaired t-test, Pearson correlation test and Receiver operator characteristic (ROC) analysis were used for data analysis. RESULTS: Our study revealed a significantly higher expression levels of miRNAs 136, 494 and 495 in exosomes of peripheral blood and matched with UCMSCs released exosomes from patients with PE compared to normal pregnancies (p=0.000). In peripheral blood of PE, they were 6.4, 3.9 and 2.1 folds higher, respectively. ROC analysis revealed that the sensitivity and specificity values of miRNA-136 were 95% and 100%, respectively, with a cut-off value of 2.55. The sensitivity and specificity values of miRNA-494 were 86% and 95%, respectively, with a cut-off value of 0.47. The sensitivity and specificity values of miRNA-495 were 90% and 83%, respectively, with a cut-off value of 1.287. CONCLUSION: Our findings suggest that exosomes derived miRNA-136, miRNA-494 and miRNA-495 could be promising circulating biomarkers in early detection of PE. Furthermore, UCMSCs released exosomes miRNA-136, miRNA-494 and miRNA-495 genes expression confirmed peripheral blood results analysis.

Willis, G. R., et al. (2018). "Macrophage Immunomodulation: The Gatekeeper for Mesenchymal Stem Cell Derived-Exosomes in Pulmonary Arterial Hypertension?" Int J Mol Sci 19(9).

Pulmonary arterial hypertension (PAH) is a progressive disease characterized by remodeling of the pulmonary arteries, increased pulmonary infiltrates, loss of vascular cross-sectional area, and elevated pulmonary vascular resistance. Despite recent advances in the management of PAH, there is a pressing need for the development of new tools to effectively treat and reduce the risk of further complications. Dysregulated immunity underlies the development of PAH, and macrophages orchestrate both the initiation and resolution of pulmonary inflammation, thus, manipulation of lung macrophage function represents an attractive target for emerging immunomodulatory

therapies, including cell-based approaches. Indeed, mesenchymal stem cell (MSC)-based therapies have shown promise, effectively modulating the macrophage fulcrum to favor an anti-inflammatory, pro-resolving phenotype, which is associated with both histological and functional benefits in preclinical models of pulmonary hypertension (PH). The complex interplay between immune system homeostasis and MSCs remains incompletely understood. Here, we highlight the importance of macrophage function in models of PH and summarize the development of MSC-based therapies, focusing on the significance of MSC exosomes (MEx) and the immunomodulatory and homeostatic mechanisms by which such therapies may afford their beneficial effects.