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Extracellular beta-Nicotinamide Adenine Dinucleotide (β-NAD) is protective against thrombin and lipopolysaccharide induced pulmonary endothelial cell barrier dysfunction

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Acute lung injury (ALI) is diffuse but heterogeneous lung parenchyma changes associated with increased capillary leakage and non-cardiogenic pulmonary edema, manifested with severe hypoxemia. Acute respiratory distress syndrome (ARDS) is a more severe condition first established in a case series by Ashbaugh et.al. in 1967 based upon 5 clinical features: (1) the presence of a defined risk; (2) severe hypoxemia despite administration of supplemental oxygen; (3) bilateral pulmonary infiltrates; (4) reduced lung compliance; (5) the absence of congestive heart failure [1].

The reported incidence of ARDS in the United States is approximately 58/100000 [2]. A multi-centered clinical study among ICU patients in Shanghai, China found an ARDS incidence of 2% [3]. Global ARDS mortality rate remains significantly constant and fluctuates between 40% - 50% [4]. Such high morbidity and mortality boosted ALI/ARDS research yet scarcely resulted in satisfactory prescriptions: beta-2 agonists [5], activated protein C (APC) [6], antioxidants [7], surfactant [8] and vasoactive drugs [9-14] all yielded limited effect among ALI/ARDS patients even given substantial benefit in animal models. Except small tidal volume ventilation strategy, such failures on pharmacology led to emphasis in repair, host immunity maintenance and lung injury suppression of therapeutic research instead. Stem/progenitor cell therapy and cell-based gene therapy are currently under investigation for their potential therapeutic effects.

Biography

Umapathy has completed his Ph.D from Bangalore University (Bangalore, India) and postdoctoral studies from Georgia Health Sciences University (GHSU, Augusta GA, USA). Presently he is research faculty at the Vascular Biology Center (GHSU, Augusta GA) and a faculty member of the Pulmonary Medicine at the GHSU hospital and participates in pulmonary fellow's basic science training. He has published more than 23 papers in reputed journals and serving as an editorial board member of two international journals. He is the Principal Investigator of biomedical research grant from the American Lung Association and co-investigator of Program Project Grant (Project 3) from the National Institute of Health.

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