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Using stem cells for stimulating tissue regeneration and functional activity in a wide spectrum of pathologies

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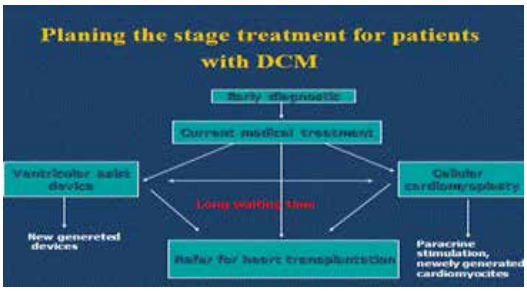
Statement of the Problem: Dilated cardiomyopathy is a serious problem in pediatric cardiology praxis. Despite the relatively low incidence of 0.57 to 2.6 per 100000 children, the mortality rate is high. One third of patients die within the first year after diagnosis. Up to 40% of these patients are defined as idiopathic dilated cardiomyopathy (IDCM), characterized by ventricular dilation and systolic dysfunction. Researchers have reposted that conventional medical therapy does not improve the outcome of the disease; however, recent clinical studies have suggested bone marrow derived autologous mononuclear cells as a promising therapy option. Pulmonary arterial hypertension (PAH) is characterized by increased pulmonary vascular resistance resulting in extensive heart structural changes leading to right heart failure and death. PAH is characterized by obstruction of small pulmonary arteries leading progressive increase in vascular resistance. Locally implanted stem cells may trigger the neovascularization process in the lung potentially leading to a decrease of pulmonary artery pressure.

Methodology: For treatment of IDCM, we prefer to use transcutaneous intramyocardial administration of autologous bone marrow derived mononuclear stem cells, combined with ultrasound monitoring. In patients with PAH intrapulmonary transplantation of stem cells was performed using intravasal injection of the stem cells by catheterization pulmonary arteries and directly in the lung tissues by using standard thoracentesis technique, performed under chest radiological control.

Conclusions: If applied wisely, the stem cell therapy appears to be a safe and effective way for stabilization of critically ill patients with both severe pulmonary arterial hypertension and idiopathic dilated cardiomyopathy. This method provides additional opportunities for symptomatic treatment and serves as a bridge for potential heart and lung transplantation.



Biography

Aris Lacis is a Cardiac Surgeon and Professor. He completed his Graduation at Riga Medical Institute in 1961. He was a General and Thoracic Surgeon at Pauls Stradins University Hospital in Riga (1964–1969); Thoracic and Cardiac Surgeon at Latvian Centre for Cardiovascular Surgery (1969–1994) and; Head of Pediatric Cardiology and Cardiac Surgery Clinic at University Children's Hospital, Riga (1994-2012). He is the President of Latvian Association for Pediatric Cardiologists, Author of 395 scientific publications, three monographs and 13 patents. He is an Investigator of more than 10 clinical trials including Cardio-surgical procedures performed under deep hypothermia and hybrid procedures etc.

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