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USING AUTOLOGOUS BONE MARROW DERIVED MONONUCLEAR STEM CELLS FOR STIMULATING TISSUE REGENERATION AND FUNCTIONAL ACTIVITY

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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 dilatation 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 transcutan 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: Ten years' experience 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

Recent Publications

1. Lācis A and Ērglis A (2011) Intramyocardial administration of autologous bone marrow mononuclear cells in a critically ill child with dilated cardiomyopathy. Cardiology in the Young 21(1):110–112.
2. Lācis A, Lubaua I, Ērglis A, et al. (2013) Neo-revascularization as the potential treatment for patient suffering from pulmonary hypertension (Myth or reality?). J. Clinical Medicine Research (CMR), 2(3):32–36.
3. Lācis A, Lubaua I, Ērglis A, et al. (2013) Management of idiopathic dilated cardiomyopathy with intramyocardial cell transplantation in children: A retrospective study of 7 patients. J. Clinical Medicine Research, 2(4):129–133.
4. Lācis A, Lubaua I, Ērglis A, et al. (2013) Safeguards and pitfalls in technique used for stem cell delivery in children suffering from idiopathic dilated cardiomyopathy. Journal of US-China Med. Science, 10(3–4):71–75.
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Biography

Aris Lacis, MD, PhD is a Cardiac Surgeon and Professor who graduated from Riga Medical Institute in 1961. He was a General and Thoracic Surgeon in P Stradina University Hospital in Riga (1964–1969); Thoracic and Cardiac Surgeon in the Latvian Centre for Cardiovascular Surgery (1969–1994). From 1994 to 2012 he was the Head of Pediatric Cardiology and Cardiac Surgery Clinic in University Children's Hospital, Riga; since 2012 he is a Consulting Professor of this Clinic. He is the President of Latvian Association for Pediatric Cardiologists and Author of 395 scientific publications, 3 monographs and 13 patents. He is an Investigator in more than 10 clinical trials including cardiosurgical procedures performed under deep hypothermia, hybrid procedures etc. In May 2009 he became first in the world to use transcutan intramyocardial delivery autologous bone marrow derived progenitor stem cells for 3 months old patient suffering from idiopathic dilated cardiomyopathy.

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