STEM CELLS AND LASER REVASCULARIZATION IN TREATMENT END-STAGE CORONARY ARTERY DISEASE

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INTRODUCTION: There is increasing group of patients who suffer from refrac-tory angina due to myocardial ischemia, and routine treatment (drugs, PCI, CABG) is often ineffective. Necessity to find a new treatment for these patients has led research-ers to investigate the potential of regenerative medicine using autologous or allogenic stem cells isolated from different tissues .

Angiogenesis, as an indirect revascularization can be induce by intramyocardial injection of autologous bone marrow stem cells. The aim of the study was to present results of use stem cells combined with transmyocardial laser revascularization in our Department.

MATERIALS AND METHODS: Eleven patients (mean age 62 years) despite intensive pharmacological treatment and disqualified from prior CABG or PCI (CCS IV) were included. All patients underwent treatment with the Holmium:YAG laser and bone marrow (nine patients-BMLR) and adipose-derived (two patients-ADLR) cells precipitate transplanted in the amount of about 1 ml per channel. Adipose –derived stem cells were implanted in our Department first time in Poland

RESULTS: In whole group mean number of channels performed for patients was 23 and average amount of stem cells was10,42x10^6 cells.

In 5 patients in BMLR group, LIMA to LAD anastomosis was additionally perfomed. 1 to 4 years follow-up was obtain from 89% of patients. Except one death a year after procedures, no major cardiac events (death, acute myocardial infarction, stroke, and malignant ventricular arrhythmias) occurred during follow-up. Among patients in follow-up, 86% had no symptoms of ischemia and 58% had no dyspnoea. Average distance without fatigue is 500 meters and mean CCS class in follow-up is I/II. In total, 86% of patients in follow-up observations reported improvement compared to the period before the operation.

In ADLR group, fresh stem cells were obtained using Celution 800/CRS system. Stem cells combined with transmyocardial laser revascularization were performed in areas not suitable for grafting. Additionally, left internal thoracic artery was implanted to LAD.

CONCLUSIONS: Stem cells combined with transmyocardial laser revascularization can be performed safety, with no perioperative complication. After up to four years majority of patients after bone morrow laser revascularization declare improvement in general health condition and less hospitalisation. Further research using stem cells are needed to find the best source of stem cells and their optimal way of administration.