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Intramyocardial bone marrow mononuclear cell injection in patients with ischemic heart disease: a safety evaluation of 333 procedures

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Background: Cardiac cell therapy has been introduced as a novel treatment option for ischemic heart disease patients. Previously, we demonstrated in a RCT that intramyocardial bone marrow mononuclear cell (BMC) injection improves myocardial perfusion in no-option patients with refractory angina pectoris (RAP). Since 2010 this procedure is a standardized treatment for refractory angina patients with myocardial ischemia without options for revascularization.

Methods: We assessed 333 patients (age 63 ± 10 years, male 88%) who underwent intramyocardial injection of BMC, mesenchymal stromal cells or placebo injection between 2005 and 2017, using the NOGA system. Periprocedural and 1 year follow-up adverse events were noted. Major events were defined as an additional intervention or a prolonged hospitalisation.

Results: The patients treated for RAP showed improved Canadian Cardiovascular Society score from 3.1 ± 0.6 at baseline to 2.2 ± 0.7 at 3 months ($P < 0.001$) whereas quality-of-life improved by 22% ($P < 0.001$). There were no fatalities as a result of the procedure. Indication for injection was RAP ($n=289$), ischemic heart failure ($n=35$), acute myocardial infarction ($n=9$). In 39 patients (11.7%) a procedural complication occurred. Of which 43.6% was defined as major event. Those existed of 3 patients with a stroke; 1 during the procedure, 1 several hours after the procedure and 1 patient had a transient ischemic attack. Six patients had a spurious aneurysm needing an intervention. Two patients had a periprocedural myocardial infarction and 2 had an asthma cardiale. One patient had pericardial effusion requiring pericardiocentesis, 1 had a ventricular tachycardia followed by electric cardioversion and 1 patient had an abdominal aortic dissection. In 4 patients the cell material was aggregated and couldn't be used. During 1 year follow-up no additional adverse events were observed.

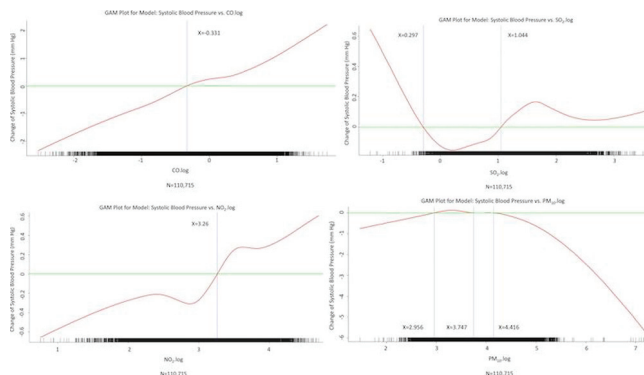
Table 1

Indication cell therapy	Complication, n (%)	Major, n (%) / Minor, n (%)
Refractory angina pectoris (n=289)	33 (11,4%)	15 (45,5%) / 18 (54,5%)
Ischemic heart failure (n=35)	4 (11,4%)	1 (25%) / 3 (75%)
Acute myocardial infarction (n=9)	2 (22%)	1 (50%) / 1 (50%)

Conclusion: Intramyocardial cell injection is relatively safe, and associated with sustained improvements of anginal complaints in no-option refractory angina patients

ENVIRONMENTAL AND GLOBAL IMPACTS ON BLOOD PRESSURE

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GAM plots for SBP vs. air pollutants

Conclusions: Short-term exposure to some ambient air pollutants affected home blood pressure in patients with chronic cardiovascular diseases.

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Evaluation the relationship between arterial hypertension and ionizing radiation as a result of the Chernobyl accident in the remote post-accidental period

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Background: Various epidemiological findings have raised awareness of possible cardiovascular risk following exposure to radiation. It is necessary to study the development of different cardiovascular disease, such as arterial hypertension, in affected population in remote post-accidental period to develop scientifically based criteria due to ionizing radiation and other hazards of the Chernobyl disaster.

Purpose: The purpose of the study was to evaluate the relationship between arterial hypertension and ionizing radiation as a result of the Chernobyl accident thirty years after Chernobyl accident.

Methods: From a database we identified clean-up workers with arterial hypertension who undergo expertise to establish causation of disease, disability and

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