PARACRINE EFFECTS OF EARLY BONE MARROW CELLS TREATMENT IN EXPERIMENTAL MYOCARDIAL INFARCTION IN RATS: TISSUE EVALUATION OF INFLAMMATORY PROCESS, REDOX STATUS AND ECHOCARDIOGRAPHIC PARAMETERS

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Background: The redox unbalance and inflammation are associated with cardiac dysfunction post-acute myocardial infarction (AMI). Transplant of bone marrow cells (BMC) can exert beneficial effects through paracrine actions on the host tissue. ***Objective:*** To assess cardiac function and its correlation with redox balance and inflammatory process in cardiac tissue 48 hours post-AMI treated with BMC. ***Methods:*** Male 8-week-old Wistar rats were randomized into four groups: Sham-operated (S); AMI; S + treatment (ST) and AMI + treatment (AMIT). Induction of AMI was accomplished through ligation of the left anterior descending coronary artery, with open-chest under mechanic ventilation. Determination of ejection fraction (EF) and infarcted area (%) were evaluated by echocardiography. Tumor necrosis factor (TNF-alpha) and Interleukin 6 (IL-6) were measured by western blot, and the oxidative stress (OE) was evaluated by reduced and oxidized glutathione ratio (GSH/GSSG) and measured by spectrophotometer. ***Results:*** Infarcted area was not different between groups AMI (52.8±5.7) vs. AMIT (54.2±4.3). EF (%) was lower in the infarcted groups: AMI (51±5%) vs. S (74±7%) ($p=0.001$) and AMIT (56±10%) vs. ST groups (73±3%) ($p=0.001$). The OE was increased in infarcted groups, AMI (8.21±3.8) vs. S (14.61±3.4) ($p<0.05$), AMIT (2.1±0.7) vs. ST (4.7±1.5) ($p<0.05$) and with treatment the OE was high, AMIT (2.1±0.7) vs. AMI (8.21±3.8) ($p<0.005$). However, it was observed that BMC treatment was able to minimize ventricular hypertrophy (mg/g) in AMIT (2.86±0.2) vs. AMI group (3.40±0.6) ($p<0.001$) and minimize TNF-alpha and IL-6 expression in infarcted treated group. We found a positive correlation between ventricular hypertrophy and cytokines' expression of TNF-alpha ($r=0.732$; $p=0.001$), and IL-6 ($r=0.720$; $p=0.001$). ***Conclusions:*** Our data suggest that BMC treatment attenuated the ventricular hypertrophy and reduced the expression of pro-inflammatory cytokines through its paracrine effects, at least in this time point.