

Biomarkers and laboratory testing for cardiovascular disease

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THE STUDY ON EXTRACORPOREAL CARDIAC SHOCK WAVE THERAPY INDUCING EPCS PROLIFERATION AND STIMULATING ISCHEMIC MYOCARDIAL ANGIOGENESIS

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Purpose To investigate the changes of EPCs proliferation and related factors in peripheral blood after the CSWT treatment.

Methods A total of 26 CAD patients undergoing extracorporeal cardiac shock wave therapy were selected. Mononuclear cells obtained from peripheral blood were cultured in EGM-2-MV medium. Cell morphology and the number of colonies formed were observed and analysed. After 7 days of culture, adherent cells were analysed and counted. Whether EPCs differentiated or not was identified by laser confocal microscopy; the number of circulating EPCs were studied by flow cytometry; the plasma level of VEGF, IL-8, SDF-1 and MMP-9 was determined by enzyme linked immunosorbent assay.

Results The cultured EPCs and EPC-CFU number in vitro were significantly increase after therapy (EPCs (18.85 ± 4.30) cell/high power field vs (30.12 ± 6.77) cell/high power field (5.08 ± 1.79) cell/high power field vs (12.27 ± 2.75) cell/high power field, all $p < 0.001$). Circulating EPCs number were significantly increased $((0.015 \pm 0.003)\%$ vs $(0.021 \pm 0.005)\%$, $p < 0.001$), VEGF, IL-8 level were significantly increased (VEGF (120.26 ± 19.85) pg/ml vs (155.19 ± 24.67) pg/ml, IL-8 (21.81 ± 5.94) pg/ml vs (149.70 ± 44.11) pg/ml, all $p < 0.01$), whereas SDF-1 and MMP-9 had no significant changes (SDF-1 (2750.87 ± 636.74) pg/ml vs (2700.47 ± 415.19) pg/ml, MMP-9 (19.66 ± 3.96) ng/ml vs (18.55 ± 3.78) ng/ml, all $p > 0.05$), compared with the group before treatment.

Conclusions The CSWT appears to promote the expression of VEGF and IL-8 proteins, also stimulates the EPCs proliferation, significantly increases the EPCs and improves its function in peripheral blood, whereas the CSWT likes not influence so obviously on the expression of SDF-1, MMP-9.