

Cardiac Function and Inflammatory Biomarkers in Patients with Recovered Takotsubo Cardiomyopathy

Zilberman, Liaz¹; Schwartzberg, Shmuel¹; Shimoni, Sara²; Bar, Iris²; Mahadi, Anat²; Jonas, Michael²; Gendelman, Gera²; Rozen, Izabella¹; Korbat, Zila¹; Ayzenberg, Oded²; George, Jacob²; Goland, Sorel¹

¹Kaplan Medical Center, Heart Failure Clinic, Heart Institute, Rehovot, Israel; ²Kaplan Medical Center, Heart Institute, Rehovot, Israel

Background: Takotsubo Cardiomyopathy (TCM) is a transient cardiomyopathy. Endothelial dysfunction is the main potential mechanism involved in the pathogenesis. Post-recovery cardiac function, endothelial progenitor cells (EPC's) and biomarkers were not evaluated in TCM yet.

Aim: To evaluate EPC's and inflammatory markers and assess cardiac function using echo techniques such as tissue Doppler (TDI) and 2D Strain (2DS) imaging in post TCM patients.

Methods: Twelve post-TCM patients were included and compared to matched controls. LV and RV function using standard echo, TDI, and 2DS was evaluated. The number of EPC's: CD34+ cells, CD34+KDR cells, vascular endothelial growth factor (VEGF) levels and inflammatory markers: hsCRP, IL6 and Ox-LDL antibodies were quantified.

Results: Twelve patients recovered from TCM (3- 12 months from the acute event, age 60 ± 13 years, 11 women, EF $58.6 \pm 7.5\%$) and matched controls (age 59 ± 7 years and EF $57.3 \pm 8.5\%$) were compared. On echo LV early diastolic velocities (E') on TDI (6.0 ± 1.2 vs. 8.1 ± 2.0 , $\rho=0.008$) were significantly lower and E/E' (14.1 ± 3.7 vs. 8.9 ± 2.8 , $\rho=0.002$) higher compared to controls.

There were no differences in global longitudinal strain and higher circumferential strain (-22 ± 3.8 vs. 16.8 ± 3.2 , $\rho=0.018$) was obtained in post-TCM patients. In addition, decreased RV global strain (-19 ± 2.8 vs. $-23 \pm 1.7\%$, $\rho=0.02$) and strain rate S (-1.0 ± 0.1 vs. -1.2 ± 0.1 , $\rho=0.01$) were found. A significant increase in CD34+KDR (0.18 ± 0.05 vs. 0.07 ± 0.04 , $\rho=0.01$) was evident, with no difference in VEGF, hsCRP, IL6 and Ox-LDL between the groups.

Conclusions: In this pilot study TDI was able to identify altered LV diastolic function in recovered patients with TCM. In addition, impaired RV function by 2D strain was found compared to healthy matched controls. Enhanced recruitment of EPC's, cells that have been implicated to improve endothelial regeneration after initial vascular injury was evident even after LV recovery in patients with Takotsubo cardiomyopathy.