

NT-proBNP increase at exercise in patients with univentricular heart after total cavopulmonary connection

Hager A., Christov F., Hess J.

Deutschen Herzzentrum München, Technische Universität München, Germany

Background: Increase of N-terminus pro B-type natriuretic peptide (NT-proBNP) during exercise was related to myocardial ischemia, myocardial dysfunction and inflammatory stress in acquired heart disease. Its value in patients with univentricular heart after total cavopulmonary connection (TCPC) is unknown.

Patients and Methods: 66 patients (19 female, age 8-52 years) with TCPC (lateral tunnel in 28 patients, extracardiac conduit in 38 patients) performed a symptom-limited cardiopulmonary exercise test on an upright bicycle ergometer. Venous NT-proBNP samples were drawn at rest and 2-3 min after peak exercise.

Results: Median NT-proBNP at rest was 82 ng/L (range 11-2554) with four patients above the upper reference limit of 480 ng/L. A higher NT-proBNP at rest was related to a worse aerobic capacity at the exercise test (ln NT-proBNP versus peakVO₂, $r=.333$, $p=.006$).

The median increase of NT-proBNP at exercise was 6 ng/L (range 0-314 ng/L). All but one patient were below the published cut-off of 80 ng/L. In a multiple regression analysis, the absolute increase of NT-proBNP was mainly related to its resting value. The relative increase was solely related to a higher body mass (Δ ln NT-proBNP versus BM, $r=.357$, $p=.003$) and not related to any of the investigated functional parameter.

Conclusions: NT-proBNP at rest is usually not elevated in TCPC patients. If so, it is a valuable predictor of cardiac function. During exercise, there is only a minor increase in NT-proBNP. Its extent is considered normal in studies with adult patients and is not related to any of the investigated functional parameter. Maybe the filling restriction from the lungs prevents atrial and ventricular overload and BNP secretion in TCPC patients.