

**Differences in Plasma B-type natriuretic peptide levels in children with univentricular heart malformation undergoing Fontan procedure**

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**Objective:** To determine plasma B-type natriuretic peptide (BNP) levels in children with complex types of univentricular heart malformation undergoing Fontan procedure.

**Methods:** In 70 patients with univentricular heart malformation BNP was determined before bidirectional Glenn anastomosis at an age (mean  $\pm$  SD) of  $0.4 \pm 0.2$  years before Fontan procedure at an age of  $2.8 \pm 1.5$  years (range 0.4–7.3) and after Fontan procedure at an age of  $9.7 \pm 4.6$  years (2.5–17.9).

**Results:** Children with univentricular CHD undergoing surgical staged palliation showed a significant decrease of plasma BNP levels undergoing Fontan procedure (mean BNP 116.4 pg/ml before Glenn anastomosis vs. 72.5 pg/ml before Fontan, ( $p < 0.05$ ) and 43.3 pg/ml after Fontan). Comparing patients before Glenn anastomosis treated with modified Blalock- Taussig (BT) - Shunt showed significant lower plasma BNP level than patients treated with pulmonary artery banding (PAB) (BNP 86 pg/ml in patients treated with BT shunt vs. 176 pg/ml treated with PAB,  $p < 0.05$ ) Comparing the morphologic type of systemic ventricle right ventricle morphology shows significant higher BNP plasma level than left ventricle morphology (BNP in left ventricle 59.1 pg/ml vs. 86.7 pg/ml in right ventricle,  $p < 0.05$ )

**Conclusions:** Plasma BNP levels decrease in patients with univentricular malformation undergoing Glenn anastomosis and Fontan due to volume relief. Patients with pressure overload of the systemic ventricle due to PAB are more affected compared to patients with volume overload due to BT-Shunt. The effect of surgical treatment on plasma BNP levels highlights the usefulness of plasma BNP levels as diagnostic tool for follow up.