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Does the type of congenital heart disease affect neurodevelopmental results?

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Abstract

Congenital heart disease patients have a higher rate of developmental disorders and cognitive delay.

A retrospective review was performed on CHD patients requiring cardiac surgery within the first year of life at Doernbecher Children's Hospital from 1/1/13-12/31/18. A surgical database collected patients' variables, including CHD, prenatal diagnosis, birth weight, gestational age, ND evaluation referral and results, and Early Intervention referral. Scaled Bayley scores were compared with ≤ 4 considered significantly delayed, 5-6 delayed, 7 low average, 8-12 average, 13 high average, and ≥ 14 superior.

Out of 151 patients, 64 (42.4%) were referred to ND services, and 60 (39.7%) patients accessed ND services, at a median age of 8.4 months. Patients with a longer length of hospital stay were more likely to undergo ND evaluation (22 vs 15 days, $p=0.02$). Hypoplastic left heart syndrome and hypoplastic right heart syndrome patients had the longest median length of stay at the hospital at 29 and 21 days, respectively. Of patients who accessed ND services, 40 (66.7%) were referred to EI. HRHS patients scored the lowest on scaled cognitive Bayley scores with a median score of 7 ($p=.0095$). HLHS and HRHS patients scored the lowest on gross motor skills, at medians of 3 and 5 respectively ($p=0.001$). TOF and HLHS patients had the largest percentage of follow-up after their initial visits (71.4% and 69.2%).

Only 42.4% of CHD patients were referred to ND services, despite known risks. Excluding single ventricle patients, there was not an association between type of CHD and ND outcomes. While most patients with CHD had low to average scores on ND testing, single ventricle patients scored particularly low in cognitive and gross motor function. More than half of the patients who received initial testing followed-up with additional appointments in all CHD categories, demonstrating the importance of initial ND evaluation.

