Neuropsychological and intellectual assessment of 45 adolescents (GUCH patients) after congenital heart defect surgery with/without cardiopulmonary bypass.

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CHD are associated with risk for cognitive development. The cognitive impairment risk in consequence of extracorporeal circulation is still largely unknown. Objective: neuropsychological and intellectual assessment of GUCH pts after surgical procedures for CHD in childhood with/without the use of cardiopulmonary bypass (CPB). Material: 45 patients aged x 17.4±19.2 years, 35 after surgery with CPB (10 pts post-VSD; 10 post-ASD II; 2 post-ASD sin.ven.+PAPVR; 1 post- ASD II,VSD,PDA; 4 post-AVS; 2 post-PVS; 2 post-VSD, ASDII; 1 post-ASD II, TVR; 1 post-AVR, AVS; 1 post-AVR; 1 Cor triatriatum) and 10pts without CPB (all post-CoAo). Methods: Wechsler/Raven Intelligence Scales, clinical trials assessing memory, attention, praxis, abstract thinking and visuospatial functions, WCST. Results: Only 5 pts scored normal on all the tests (3 post-CPB pts = 8.5%, 2 post-VSD, 1 post-ASD sin.ven.+PAPVR; 2 non-CPB pts = 20%, 2 post-CoAo). Post-CPB pts obtained 75.5% normal scores, while non-CPB group - 81.3%. The non-CPB group scored significantly lower in visuospatial functions (70% subnormal scores vs. 42% in CPB pts) and verbal abstract reasoning (30% subnormal scores vs. 5.7% in EC pts). Frontal impairment was the most common in both groups (70% in non-CPB, 60% CPB pts), formal verbal fluency generating the worst results (62% CPB/50% non-CPB pts below normal), WCST (20% non-CPB/14% CPB pts below normal), and auditory verbal learning (20% non-CPB/14% CPB pts below normal). In the CPB group, intellectual development disruption was more common (28%), with intellectual disability in 2 pts, and disharmony typical for organic dysfunction in 8 pts (1 pt in non-CPB group). Medium IQ score was slightly higher in post-CPB group (94 vs. 102 IQ points). Conclusions: 1. Regardless of the CPB use, executive function impairments are the most common neurodevelopmental abnormalities among GUCH patients, being more frequent and severe in post-CPB pts. 2. General intellectual development in post-CPB pts is more commonly disturbed, but associated with higher total scores than in non-CPB pts. 3. Visuospatial and verbal memory dysfunction is significantly more common in non-CPB group, suggesting a possible association with defect type (all CoAo pts). The study was implemented using funds allocated by the National Center of Science.