Early remedial services use in children with transposition of the great arteries: prevalence and associated factors

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Objectives
There is growing concern regarding neurocognitive screening and remediation strategies for children with congenital heart disease (CHD). Some developmental delays and cognitive impairments may be observed before school entry and may require early preventive or treatment interventions. No data is currently available on the early utilization of these services after CHD. As early remediation may be essential for better long term prognostics, the objective of this study is to characterize the prevalence of early remedial service use and its associated demographic, medical and cognitive factors in children aged 4 to 6 years with corrected transposition of the great arteries (TGA).

Methods
Neurocognitive outcomes after TGA, the prevalence and characteristics of children's educational and/or rehabilitation services utilization were prospectively evaluated. Forty-five eligible patients (mean age= 5 y 4 mo; 67% males) underwent formal neuropsychological testing including IQ and a comprehensive battery of executive functions (EF) including motor and interference control, short-term memory and working memory as well as cognitive flexibility. Parental reports on the children's behavior and executive functions were also evaluated. Demographic factors, pre-operative, intra-operative and post-operative factors as well as cognitive factors were examined according to the current use of remediation.

Results
Twenty-four (53%) patients were receiving remedial services that included educational supports, speech, psychology and occupational therapy and neurological follow-up. Male gender (p=0.04), a postnatal diagnosis of TGA (p=0.03) and a longer postoperative ICU stay (p=0.04) were significantly associated to remediation use. Children currently receiving remediation had lower EF scores (ps<0.01), had more severe EF deficits as observed by formal testing (p=0.001) and were rated by their parents as having more behavioral daily-life difficulties (p=0.01). However, in the group without remediation, 13 children (43%) also displayed EF deficits rated as moderate to severe.

Conclusions
Educational and rehabilitation resources are frequently used by young children with TGA. Associated demographic (male gender) and medical factors (postnatal diagnosis of TGA and longer postoperative ICU stay) could help identify children at higher risk for neurocognitive delays. Evaluation of EF from an early age is necessary as it may influence prompt referral for remediation.