EFFECTS OF AORTIC ARCH SURGERY ON CHILD NEUROLOGICAL DEVELOPMENT


OBJECTIVE
Detect possible modifiable factors in the Selective Cerebral Perfusion (SCP) that can help minimize subsequent neurological effects.

METHODS
Prospective cohort design. The sample consists of those children who were less than 3 years old at the time of the repair surgery, with biventricular physiology, operated on aortic arch pathology using cardiopulmonary bypass and SCP, during the period from August 10, 2004 to the May 24, 2016.

Those patients with a score on the mRS (modified Rankin score) of 2 points or more were classified as having neurological dysfunction. Neurological dysfunction was defined as those patients in timely need of help with daily activities, and in which the doctor, patient and/or family are aware of a neurological deficit. Patients with genetic disorders were excluded.

RESULTS
82 patients met the selection criteria, of which 81 accepted to participate in the study. 36 cases (44%) were women.
Mean age at the time of surgery was 1.8 months, median age at the time of surgery 0.5 months, with an age range of 0.1-32 months. Cardiac surgery was performed with SCP on children less than 10 days old in 22 cases (27%). The mean time in minutes of SCP was 31, with a median of 30 and a range of 16-66 minutes. Average cooling time was 31 (8-60) minutes and average heating was 43 (15-90) minutes.

In the group of neurological dysfunction, 35% of a total of 64 patients were studied. And the following risk factors for neurological dysfunction were detected: surgery in children under 10 days of age, duration of SCP greater than 40 minutes, cooling less than 15 minutes and above 40 minutes, and heating below 15 minutes and above 40 minutes during CPB.

CONCLUSION
The neurological repercussion of SCP use is greater when the patient's age is lower, especially in children under 10 days. Lower morbidity is observed at the neurological level when SCP surgery in the repair of aortic coarctation and/or hypoplasia of the aortic arch is performed between 15 and 30 days of life. Within the therapeutic process of patients with aortic arch pathology operated on during the first year of life with SCP there may be modifiable factors that may contribute to subsequent neurological development such as flow during SCP, SCP time, as well as cooling and heating time.