

Cerebral function changes in children with congenital heart disease

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Introduction

Infants with congenital heart disease (CHD) as well as Survivors of cardiac surgeries are at risk for brain injury and neurodevelopmental defecits. It is thus necessary to evaluate and follow up cerebral functions by the use of electroencephalogram (EEG) in patients with CHD.

The aim of this work is to evaluate the cerebral function in children with congenital heart disease using aEEG to detect abnormalities in the cerebral function and to correlate this to the oxygen saturation

Patients and Methods

We performed digital EEG and brain mapping in 60 children (28 (46.7%) males and 32 (53.3%) females) with CHD (40 (66.7%) with cyanotic CHD (%) and 20 (33.3%) with acyanotic CHD (%)) as well as 40 age and sex matched healthy controls.

Results:

The patients' mean age was 39.8 ± 15.9 months, and the mean weight was 9 ± 5.7 kg. There was no significant difference between patients and controls regarding the age but patients had significantly lower anthropometric measures (weight, height and BMI) with $p < 0.0001$, $p < 0.0001$ & $p = 0.001$ respectively.

14 (23.3%) patients had prior cardiac surgery, of them 8(57%) had open heart surgeries & 6(43%) had closed heart surgeries. 38(63.3%) of our studied patients had pulmonary hypertension.

EEG findings were present in 30 (50%) patients (28 patients with cyanotic and 2 with acyanotic CHD) while all controls had normal EEGs. Detected EEG changes were: Epileptic activity in 2(3.3%) patients (both with cyanotic CHD), Background activity slowing in 14 (23.3%) patients (all with cyanotic CHD), while both epileptic changes & back ground activity slowing were detected in 14 (23.3 %) patients (12 with cyanotic and 2 with acyanotic CHD).

The cut off value of O₂ saturation below which epileptic changes are liable to occur was 73.5%, while that for back ground activity slowing was 77.5%.

Conclusion:

Children with cyanotic CHD had significantly higher EEG changes than those with acyanotic CHD. The aEEG should be performed routinely in patients with CHD (particularly cyanotic) to detect abnormalities in the cerebral function, allowing for early treatment.