

# **Serum Neuron Specific Enolase use in Detecting Brain Injury in Children with Congenital Heart Disease before Undergoing Cardiac Surgery**

## **Abstract**

**Background:** Many children with Congenital Heart Disease (CHD) suffer from neurological derangements, whether clinically evident or subtle. Brain injury may be pre-existing before surgery, making them at increased risk of adverse perioperative neurological outcomes. Serum Neuron-Specific Enolase (sNSE) is a well appreciated marker for neuronal damage that has been demonstrated to detect perioperative brain affection in children with CHD.

**Aim of the study:** The study aimed to utilize sNSE to detect presence of brain injury in children with CHD prior to performing cardiac surgery.

**Methods:** The study included 85 children divided into two groups; Group I included 45 patients with CHD while Group II (control) included 40 healthy children of the same age group. Patients were included if they had clinical and echocardiographic documentation of CHD. Children with preexisting neurological disorders or previous surgery were excluded. Blood samples were withdrawn from every participant to measure sNSE.

**Results:** sNSE level was significantly higher in Group I than Group II, with a mean value of  $6.90 \pm 6.94$  and  $3.79 \pm 2.26$ , respectively (p-value 0.008). No significant correlation was found between sNSE levels and age, body mass index, or sex. There was no significant difference between cyanotic and acyanotic CHD patients.

**Conclusion:** sNSE measurement demonstrated the presence of a significantly higher incidence of baseline brain damage in CHD patients compared to normal subjects, before undergoing any interventions. sNSE could be further investigated as a risk stratifying tool to label children at risk of developing adverse neurological outcomes after surgery.