

Effect of Cardiopulmonary Bypass Duration on Thyroid Function Tests after Open Heart Surgery in Children

S. Shiva, M. Samadi, B. Rastghar, A. Jafari Javid and S.H. Shiva

Department of Pediatrics, Pediatric Health Research Center and Cardiovascular Research Center,
Tabriz University of Medical Sciences, Tabriz, Islamic Republic Iran

Abstract: This study was designed to evaluate the effect of cardiopulmonary bypass duration on thyroid function in children undergoing open heart surgery. One hundred and five children with congenital heart disease in-need of open heart surgery with cardiopulmonary bypass were enrolled during a 12-month period. Patients categorized into two groups: Short-time cardiopulmonary bypass (<90 min) and long-time cardiopulmonary bypass (≥ 90 min). Serum levels of Triiodothyronine (T3), Thyroxine (T4) and Thyroid Stimulating Hormone (TSH) were measured 2 h before surgery and 2 and 5 days after operation. If needed another laboratory investigation was carried out on week 2 after operation. There were 46 (28 males, 18 females with the mean age of 5.63 ± 3.64 years) and 59 (30 males, 29 females with the mean age of 4.59 ± 3.18 years) children in short-time and long-time cardiopulmonary bypass groups, respectively ($p > 0.05$). The mean serum level of T3, T4 and TSH was not significantly different between the two groups. In each groups, serum TSH and thyroid hormones were decreased until 2 h and 2 days after post-operation, respectively, with gradual increase afterward. Decline of serum thyroid hormones was more longstanding in the long-time cardiopulmonary bypass group. Two weeks after operation, repeating the same laboratory tests in patients with defective results yielded normal consequences. According to our results, there is a transient laboratory abnormality in thyroid function tests in children undergoing cardiopulmonary bypass. This abnormality persists longer in patients with long-time cardiopulmonary bypass.

Key words: Congenital heart disease, transient thyroid dysfunction, cardiac surgery, children, long-time
