

**Comparison of perioperative C-reactive protein between neonates after the Norwood procedure or arterial switch operation**

Yu X. (1), Larsen B.(2), Cheyesh A.(1), Rebeyka I.(3), Li J.(1)  
Department of Pediatrics (1), University of Alberta, Edmonton, Canada  
Nutrition Service (2), Alberta Health Services, Edmonton, Canada  
Department of Surgery (3), University of Alberta, Edmonton, Canada

**Objectives:** C-reactive protein (CRP) is a widely used indicator of systemic inflammatory response in patients with cardiovascular diseases, including heart failure and after cardiopulmonary bypass (CPB). Neonates undergoing the Norwood procedure (NP) have a poorer systemic hemodynamic and oxygen transport status than other CPB surgeries. We compared CRP levels between the two groups of neonates after NP or arterial switch operation (ASO).

**Methods:** Charts of 170 neonates from 2003-2009 were reviewed (n=89 in NP group, n=81 in ASO group). CRP was measured in 66 neonates in NP group and 47 in ASO group twice weekly and recorded prior to and within 20 days after CBP. White blood cells, doses of inotropes and steroid, cultures of blood and body fluids were recorded. Demographic data included the durations of CPB, aortic cross clamp and circulatory arrest, ICU and hospital stay.

**Results:** NP group had a shorter CPB (109±39min) and aortic cross clamp (44±19 min) than ASO group (143±76 min and 75±26 min) (p=0.002 and p<0.0001 respectively), but a longer circulatory arrest (22±11 min vs. 8±11 min, p<0.0001). Prior to CPB, CRP was higher in NP group than ASO group (21.6±24.0 mg/L vs. 13.1±25.6 mg/L, p=0.01). CRP increased to 80.2±47.7 mg/L in day1-2 after NP and 73.2±35.8 mg/L after ASO (p<0.0001 for both groups), then gradually decreased to 40.9±35.7 mg/L in NP group and to 20.0±18.6 mg/L in ASO group by day20 (p<0.0001 for both groups).

Throughout the postoperative period, CRP was significantly higher in NP group than ASO group (p=0.036). When the two group data were analyzed together, CRP was significantly and positively correlated with neutrophil count (p=0.0008) and negatively correlated with lymphocyte count (p=0.008), not with other variables.

**Conclusions:** Neonates undergoing NP have a greater systemic inflammation before and after CPB than those undergoing ASO, despite shorter CPB and ACC. This may indicate an important role of systemic hemodynamics and oxygen transport status in systemic inflammatory response in addition to CPB in neonates with congenital heart defects.