

POSTOPERATIVE OUTCOMES AND ORGAN DYSFUNCTION IN MALNOURISHED CHILDREN UNDERGOING CONGENITAL HEART SURGERY

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Background: Children with congenital heart disease (CHD) are at increased risk of malnutrition. The physiologic and metabolic stress associated with anesthesia, surgery, cardiopulmonary bypass and inotropic support is less well tolerated by malnourished patients. The aim of this study was to determine the impact of malnutrition and organ dysfunction on outcomes after surgery for CHD in childhood.

Materials/Methods: Retrospective cohort study of children greater than 30 days of age who were admitted to the cardiac intensive care unit (CICU) for 3 or more days following surgery for CHD. Nutritional status was assessed according to the WHO and CDC weight for age (WFA) Z-scores. Malnutrition was defined as WFA Z-score < -1. Duration of mechanical ventilation, CICU and hospital lengths of stay (LOS), and Pediatric Sequential Organ Failure Assessment scores (pSOFA) were recorded. Organ dysfunction was defined as pSOFA score > 5. Comparative data are expressed as median with interquartile range.

Results: The cohort included 495 children, median age 0.5 (0.3-3.6) yrs. The prevalence of malnutrition was 54% (267/495). Malnourished children were younger [0.4 (0.2-0.9) vs 1.6 (0.3-5.5) yrs, $p < 0.0001$], had longer postoperative ventilation [30 (22-78) hrs vs 24 (9-38) hrs, $p < 0.0001$], longer CICU LOS [5 (3-10) vs 4 (3-6) days, $p < 0.0001$], and longer hospital LOS [10 (7-19) vs 8 (6-13) days, $p < 0.0001$] than those without malnutrition. Malnourished patients had greater organ dysfunction on postoperative day 1; OR 1.7 (1.12-2.67, $p < 0.01$). After adjusting for age, surgical complexity, duration of ventilation and pSOFA score, malnourished patients were more likely to have longer CICU and hospital LOS: OR 1.03 (1.00-1.05, $p < 0.05$) and OR 1.01 (1.00-1.02, $p < 0.01$) for CICU and hospital LOS, respectively. Overall mortality was 2.2% (11/495) and was not associated with malnutrition.

Conclusions: Malnutrition was common in this cohort of infants and young children undergoing surgery for CHD. While malnutrition was not a risk factor for mortality, it was associated with more postoperative organ dysfunction and greater resource utilization. Future work in reducing preoperative malnutrition is warranted.