The evaluation of nosocomial infection prevalence and risk factors in pediatric patients with extracorporeal membrane oxygenation support


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Objectives: Extracorporeal membrane oxygenation (ECMO) to provide temporary respiratory and cardiovascular support in intensive care units has become a standard technique over the past few decades. We undertook a review of the data of patients who received ECMO support to determine the risk factors and causal organisms related to acquired infections in pediatric ECMO patients.

Methods: Sixty-six patients who received ECMO support in pediatric cardiac intensive care unit at Mehmet Akif Ersoy Thoracic and Cardiovascular Surgery Center in years between January 2011-June 2014 were included in this retrospective study. Demographic, echocardiographic, hemodynamic features and surgical procedures were reviewed.

Results: A total of 66 patients received a total of 292.5 days of VA-ECMO support were revealed in pediatric ICU. Sixty of them were postoperative patients, 6 patients were internalized by different indications. 45 patients weaned from ECMO support with an ECMO survival of 68.2 %. There were 13 (37.2%) blood stream infections (BSI), 10 (29.4%) respiratory tract infections (RTI), 9 (25.7%) urinary tract infections (UTI) and 2 surgical site infection (5.7%). The rate of infection was 116.2/1000 ecmo days. Gram negative bacteria accounted for 44.1 % (15/34), gram positive bacteria 26.5% (9/34), Candida 29.4 % (10/34) of the total culture positive pathogens. When infected and non infected patient groups were compared; prolonged ICU stay, duration of ventilation and the duration of ECMO were associated with the development of nosocomial infection in patients received ECMO support (p=0.045, p=0.030, p=0.040 respectively). Multivariate logistic regression analysis revealed only the duration of ECMO as an independent risk factor for nosocomial infections in patients received ECMO support (OR:1.318 (CI:1.066-1.63; p=0.011).

Conclusions: ECMO is a life saving modality in perioperative cardiac patients. The establishment of a prophylactic antibiotic regimen covering the most prevalent microorganisms in ICU and a standardized protocol for ECMO practice, with the more strict application of ECMO indications would lead an improvement in infection incidence along with hospital surveillance of the patient group.