

Colonization with multi-resistant gram-negative (MRGN) bacteria in paediatric cardiovascular surgery – is it an additional risk factor for post-operative morbidity?

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Objectives:

The incidence of patients who are colonized with multi-resistant gram-negative (MRGN) bacteria showed a significant increase over the recent years. This finding is paralleled by an increased number of nosocomial infections due to MRGN bacteria. In this study, we aimed to determine the prevalence of colonization with MRGN bacteria in a paediatric population after cardiac surgery and its impact on early postoperative outcome.

Methods:

Retrospective analysis of all patients who were treated on our paediatric cardiac intensive care unit (PCICU) between January 2012 and December 2015. The following parameters were obtained: demographic information, MRGN status on admission to the PCICU, type of underlying cardiac pathology, type of operation, duration of postsurgical PCICU stay, systemic-inflammatory-response-syndrome (SIRS) criteria, change in empirical antibiotic therapy and the crude mortality rate (CMR). A subgroup analysis of these outcome parameters was performed in patients after Fontan completion (MRGN-positive vs. MRGN-negative).

Results:

During the study period of four years, a total of 150 (8,3%) of 1818 patients operated on with cardiopulmonary bypass were found to be MRGN-positive prior to the admission to the PCICU. Of these, 33 (22%) patients were found to be ESBL-positive, 70 (45,3%) MRGN2- positive, 48 (31,3%) MRGN3-positive and 1 (0,7%) MRGN 4-positive. There was no statistically significant difference in the CMR between MRGN-positive patients and the overall group (0,7% vs. 2,4%). 14(9,3%) MRGN-positive patients fulfilled SIRS criteria. In 49 (32,7%) of MRGN-positive patients, empirical antibiotic therapy was changed, that was associated with prolonged hospital stay. In the subgroup analysis of patients after Fontan completion, there was no significant difference in CMR and morbidity (ICU-Stay, hospital stay) between MRGN-positive (n=9) and MRGN-negative patients.

Conclusion:

Early detection of MRGN-colonization prior to operation can help to manage this challenging clinical scenario. With informed change of empirical antibiotic therapy we were able to manage the problem without clinical deterioration, also in patient with abnormal hemodynamics. Early MRGN screening of vulnerable patient populations seems to be an important measure to reduce morbidity and mortality.