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Effect of Modified Ultrafiltration of Blood on the Immune Response of Body in Children

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Objectives: This paper deals with the scientific analysis of the immune response during cardiopulmonary bypass. Methods of ultrafiltration (UF) and modified ultrafiltration (MUF) have found application in the practice of surgical interventions with the use of artificial circulation (IC) more than 20 years ago and remain relevant at the present time.

Methods: Authors conducted a retrospective analysis of the cases of children born with congenital heart disease from 2011 to 2016.

Results: Before the operation, the plasma levels of TNF in the Group 1 was within physiological limits and was 13.4 ± 2.24 pg/ml. In Group 2, at this stage, the figure was 11.5 ± 0.02 pg/ml. In Phase 2 of the study, during the CPB, no significant changes in the levels of TNF in the Group 1 were observed and its scale was 16.4 ± 2.61 pg/ml. In Group 2, at this stage, the figure also did not change significantly and amounted to 14.9 ± 0.28 pg/ml. In Phase 3 after UF in Group 1, there was a significant change of the levels of TNF, which have dropped to 9.9 ± 0.84 pg/ml. In Group 2, on the contrary, was a significant increase up to 18.94 ± 2.15 pg/ml. In Phase 4 of the study, 3 hours after the operation, there was a speaker in relation to the plasma concentrations of TNF – its value was significantly decreased to 7.1 ± 5.26 pg/ml.

Conclusions: These data suggest that ultrafiltration of blood can effectively eliminate unrelated cell receptors and plasma protein cytokines. The use of UF and MUF methods allows controlled removal of excess fluid from the bloodstream, reducing the likelihood of edema development. Removal of inflammatory mediators from the bloodstream reduces the emergence of the syndrome of a systemic inflammatory response.