Abstract

In general, it is possible to characterize neonatal immune system (IS) as immature in comparison to adult IS. From a clinical point of view, newborns show an increased susceptibility to infections. Breastfeeding can contribute to the descent incidence of illnesses, because it supplies the intestinal mucosal system with antibodies of the mother`s origin, important nutrients and other immunoregulatory components. Breast milk compensates decreased newborn´s capacity to produce immunoglobulins– especially IgA, that concentration reaches adult levels in two years, but even later (to the pubescent period). Other classes of antibodies are found in cord blood only sporadically except IgG, which is transferred transplacentary. Reduced ability of B lymphocytes to produce antibodies is caused by insufficient expression of surface costimulatory signals of Th2 cells. T lymphocytes are not able to react properly to low doses of stimulators (polyclonal activators – phytoid lectins: ConA or PHA), which bind to T cell receptors in complex with CD3 and proliferate in a response to anti-CD3 monoclonal antibodies. Most of the cord blood T lymphocytes display „naive“ phenotype CD45RA. During intrauterine development**,** neonatal IS is in contact with mother IS and because a pro-inflammatory Th1 response could lead to abortion, Th2 cell response is preferred. Preferential Th2 response is typical for newborns even during the postnatal period. Neonatal lymphocytes produce less cytokines. As well as neonatal antigen presenting cells (APC) express lower levels of surface costimulatory and activating molecules. Neonatal dendritic cells prefer to induce tolerance after engulfing apoptotic or necrotic cells and produce little cytokines. Nonadaptive neonatal immunity, which recognizes characteristic pathogen markers, is not well developed. Neonatal neutrophils, as the main phagocyte granulocytes, are characterized by a diminished ability of chemotaxis, migration and pathogens killing. Complement proteins take part in nonadaptive eradication of pathogens together with granulocytes. All the components of the neonatal complement system reach lower levels than in adult blood that`s why the opsonization and lyses are less efficient.