

## Abstract

Allergy is one of the most common diseases. Identification of early prognostic markers pointing to an increased risk of allergy development is therefore of increasing importance.

Cord blood represents an easily attainable clinical material for searching for prognostic markers signaling future allergy development. Proportions of Th1 cytokines, Th2 cytokines and regulatory cytokines were tested in cord blood of children of allergic mothers (children in relatively high risk of allergy development) in comparison with cord blood of children of healthy mothers (low risk children). Also the activities of lymphocytes, dendritic cells (DC) and regulatory cells (Tregs) were compared in children of healthy and allergic mothers.

The generally increased activity of both *in vitro* stimulated and non-stimulated mononuclear cord blood leukocytes was proved in children of allergic mothers in comparison with low risk children. The increased activity of DC of high risk children was detectable only after polyclonal stimulation. Significantly less pronounced functional properties of cord blood Tregs were found in children of allergic mothers when compared with children of healthy mothers. The increased reactivity of lymphocytes and DC together with the decreased activity of Tregs can support an easier sensitization/allergisation of genetically predisposed individuals.

An early postnatal application of the probiotic vaccine Colinfant New Born (*E. coli* O83:K24:H31) appeared to be an efficient preventive measure limiting the future allergy development in predisposed children. Significantly lower incidence of later allergy in high risk children comparable with the incidence in low risk children was proved in Colinfant colonized children of allergic mothers. The mechanism of probiotic effect is not fully understood yet. It is possible to suppose the improvement of Tregs function in Colinfant colonized high risk children can be explained as one of beneficial effects of the probiotic.