Immune response features during viral diarrhea as a risk factor for the development of functional gastrointestinal disorders in children

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Background

Immune response in viral gastroenteritis (VG) is of considerable importance, as immune mechanisms can be involved in visceral hypersensitivity chronic inflammation in the mucosa formation in patients with functional gastrointestinal disorders (FGD). Purpose of the study: to establish immune response features in VG in children, promoting the development of FGD.

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Methods

The study included 147 children aged 1-7 years with rotavirus (n=60, group I), norovirus (n=57, group II) and rota-norovirus infections (n=30, group III) approved with PCR in feces. Immune status (definition of the main subpopulations of leukocytes, evaluation of interferon status, determination of the concentration of serum immunoglobulins) was carried twice in the 3rd-5th and 18th-21th days of the disease. The convalescents of viral gastroenteritis were observed out patiently at the Saint-Petersburg Pasteur Research Institute for 12 months (with clinical examinations 1 time in 3 months) with the purpose of revealing FGD in accordance with Rome IV criteria.

Results

FGD were diagnosed in 30 convalescents of VG, 14 (23.3%) in group I, 9 (16.4%) in group II and 7 (25, 0%) in group III ($p = 0.4$).

Children with FGD in acute period of VG more frequently had virus-induced IFN production suppression ($p=0.02$), and CD8 lymphocytes level decrease ($p=0.03$). The most pronounced changes in these indicators were found in children in III group. In the 2nd period (18-21 days) children with FGD had an increase in the level of CD25 + lymphocytes ($p=0.05$), and relatively lower levels of serum IgA ($p=0.04$).

Serum Immunoglobulin level

Serum interferon level

Lymphocyte cell count

Conclusions

An increased risk of FGD formation is observed in children after VG if detecting suppression of virus-induced IFN production, decrease in CD8 lymphocytes in acute period of VG, an increase of CD25 lymphocytes during the reconvalescence period of VG.

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