Dysregulation of the immune system in children with Graves disease – the role of NK and NKT-like cells

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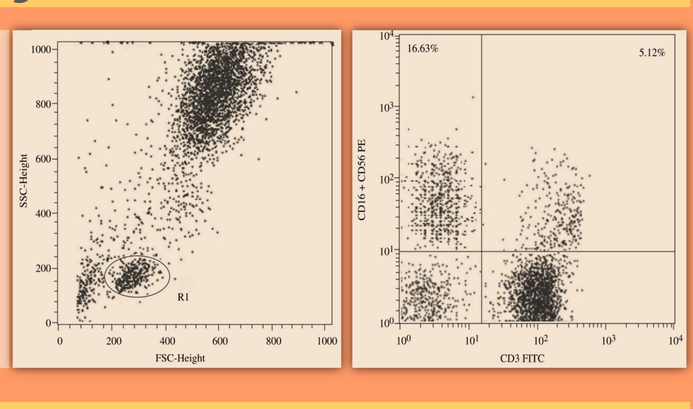
Introduction

Almost all cases of hyperthyroidism in children result from Graves' disease (GD). Recent studies have confirmed a significant role of T cells in the development of autoimmune diseases. However, the interactions between NKT-like cells and NK cells in GD are still poorly understood [1-3].

Objectives

The aim of the study was to assess the frequencies of peripheral blood T, NK and NKT-like cells in children with GD.



Methods

We studied 50 GD and 20 age- and sex-matched healthy children. Percentages of NK and NKT-like cells were evaluated with flow cytometry using monoclonal antibodies: anti-CD3/FITC, CD16CD56/PE, CD45/PerCP (BD Biosciences), which allowed for simultaneous assessment of CD3+ T lymphocytes and NK (CD16+CD56+) cells. During analysis, the CD3+CD16+CD56+ population was also determined. Immunofluorescence studies on T cell subsets were performed using a combination of the following mAbs: CD3/FITC, CD19/PE, CD8/FITC, CD4/PE, purchased from R&D Systems. Statistical analysis of the results was conducted using Statistica 9.0. A value p less than 0.05 was considered statistically significant.

Fig. 1.

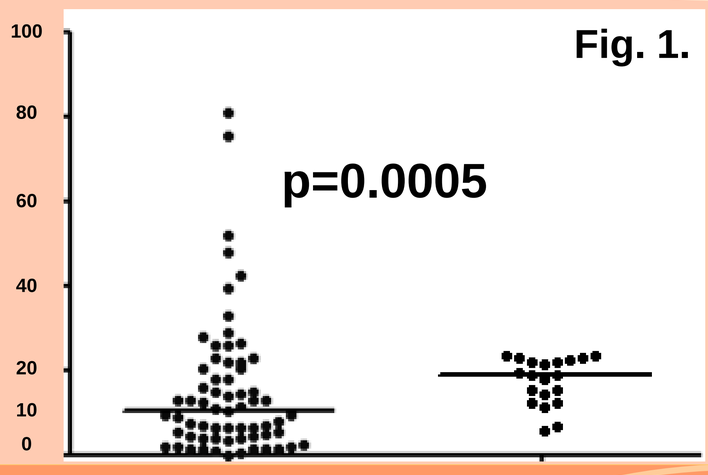


Fig. 2.

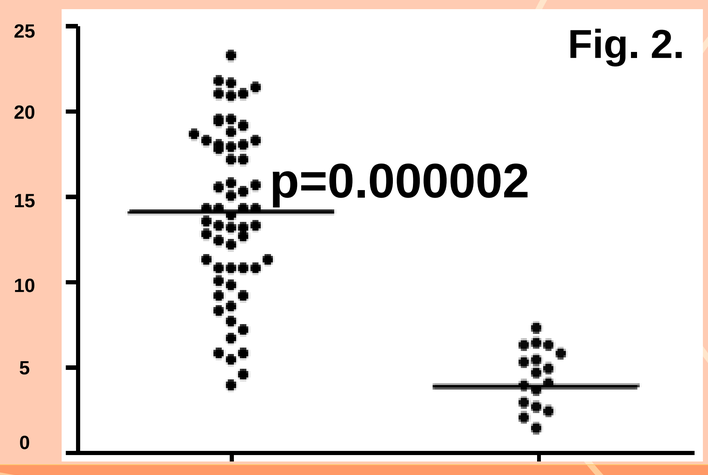
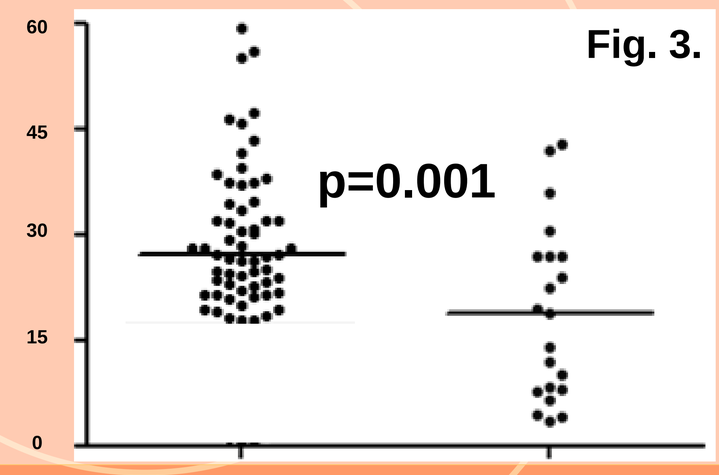


Fig. 3.

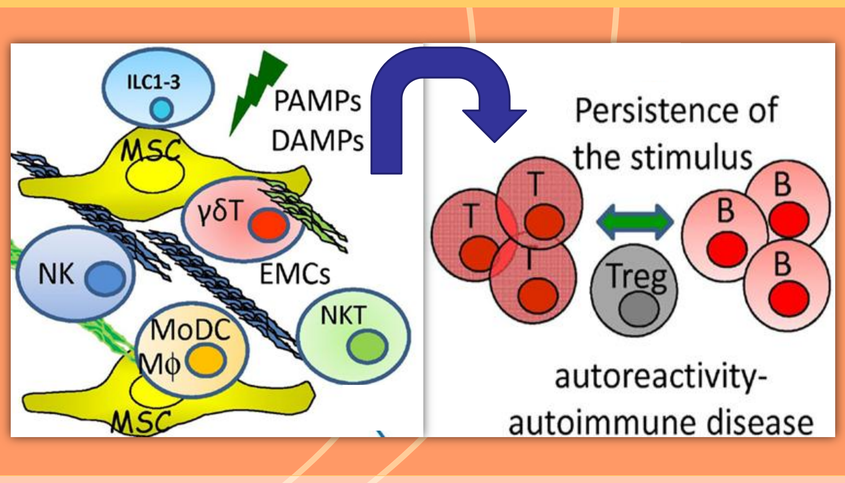


Results

The mean frequency of CD3+CD56+CD16+ NKT-like cells in the peripheral blood of children with GD was 10.93%±11.02% and this value was significantly lower in comparison to the control group (21.15%±9.08%, p=0.0005, Fig. 1). The mean percentage of CD56+CD16+ NK cells in the group of patients was 14.67%±6.89%, and was significantly higher compared to the healthy controls (4.71%±2.99%, p=0.000002 , Fig. 2). The mean percentage of CD3+ T lymphocytes in the peripheral blood of children with GD was 67.91%±16.56% and was significantly higher in comparison to the control group (51.7%±24.12%, p=0.02). The mean percentage of CD8+ T lymphocytes in the study group was 28.89%±11.68% and was significantly higher in comparison to the healthy controls (18.72%±6.86%, p=0.001, Fig. 3).

Conclusions

Our findings of the abnormalities in immune cells distribution in peripheral blood of GD children suggest that GD development and progression is related to the dysregulation of the immune system. Low innate response that...



...determines the persistence of the danger signal leads to generation of autoreactive T and B cells. Autoreactive lymphocytes are controlled by Treg cells but chronic stimulation breaks the tolerance leading to autoimmune disease [4].

References:

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Thyroid
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