

Effect of DNA-hydrolyzing catalytic IgGs from schizophrenia patients on cell viability of the SH-SY5Y cell line

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Motivation and Aim: DNA-hydrolyzing catalytic IgGs have cytotoxic effects in autoimmune diseases [1, 2]. Such IgG antibodies penetrate the cell membrane, affect intracellular processes and activate cell death processes [3]. Recently, DNA-hydrolyzing IgGs have been discovered in schizophrenia [4]. However, their cytotoxic properties have not been studied. The aim of this study was to investigate the effects of IgG isolated from the serum of schizophrenic patients with DNA-hydrolyzing activity on cell viability of the SH-SY5Y human neuroblastoma cell line *in vitro*.

Methods: Serum of patients with paranoid schizophrenia (F 20.00, F 20.01, F20.02) in the acute phase and mentally and somatically healthy persons matched by sex and age was used. IgG was purified from serum by affinity chromatography on Protein-G-Sepharose columns. The homogeneity of the preparations was confirmed by 12.5 % PAGE. The DNA hydrolyzing activity of IgG was assessed by the degree of hydrolysis of the pBluescript plasmid. The cell viability of the SH-SY5Y cell line after exposure to purified IgG preparations was assessed by high-throughput screening on the CellInsight CX7 platform (Thermo Scientific, USA) using the fluorescent dyes propidium iodide and Hoechst. The final antibody concentration was 0.1 and 0.2 mg/ml. Statistical analysis was performed using the SPSS software, release 20.0, for Windows. Median, first and third quartiles were calculated. Between-group differences were evaluated using Mann–Whitney U test.

Results: Four of the eight obtained IgG preparation had high DNA-hydrolyzing activity. All tested IgG preparations from healthy donors were inactive. The percentage of dead cells SH-SY5Y after exposure to IgG (0.1 mg/ml) with DNA-hydrolyzing activity after 24 hours was 4.5 [3.9; 5.1] %. When IgG patients without activity was added to the cell culture, the percentage of dead cells was 4.5 [4.3; 5.1] %. When IgG of healthy donors was added to the cell culture, this indicator was 4.9 [4.7; 5.4] %. One-way ANOVA analysis showed no significant differences in the percentage of dead cells between groups. Similar results were obtained at a higher concentration of antibodies –0.2 mg/ml.

Conclusion: Thus, it has been shown *in vitro* that IgGs isolated from the serum of schizophrenia patients with or without DNA-hydrolyzing activity does not exhibit cytotoxic properties against the SH-SY5Y human neuroblastoma cell line. It is possible that the absence of the cytotoxic effect of DNA-hydrolyzing IgGs is due to the high level of protective properties of neuroblastoma [5].

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