Apoptosis and mitochondrial membrane potential changes of T lymphocytes from children with Down’s syndrome

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Abstract:

Background: Down's syndrome (DS) patients present a high risk of developing alterations of the immune system. The increased susceptibility to bacterial and viral infection, hematologic malignancies and autoimmune disease, suggest that immunodeficiency is an integral part of DS. Little is known about the mitochondrial damage and tendency to apoptosis in peripheral T lymphocyte cells in DS individuals. Objective: to evaluate the tendency to apoptosis and mitochondrial membrane potential (ΔΨm) changes in peripheral T lymphocytes of DS children both in the presence and in the absence of acute infection. Patients and methods: The present study included thirty children had DS (all of them trisomy 21 of nondisjunction type), and thirty normal children, fifteen of each group had no evidence of acute infection and fifteen had acute infection. Potential apoptosis was measured by flow cytometry using annexin V. The ΔΨm was assessed by the retention of Rhodamine 123. Results: There was no significant difference in the percentage of CD3+ cells or potential apoptotic T lymphocytes between DS children and controls either in presence or in absence of acute infection. However, there was a significant decrease in ΔΨm in the peripheral T lymphocytes of DS children when compared to the controls. Conclusion: The function of T cells not their number is the main mechanism responsible for the impairment of the immune system in DS children. T lymphocytes in peripheral blood from DS patients do not display an increased tendency to undergo apoptosis although a significant loss of ΔΨm was found.

Keywords:

Down's syndrome, apoptosis, mitochondrial membrane potential.

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