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TOXOPLASMA GONDII AS A POSSIBLE PATHOGEN OF TYPE-1 DIABETES MELLITUS: EVIDENCE FROM CASE-CONTROL AND EXPERIMENTAL STUDIES

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Toxoplasma gondii **is an obligate intracellular parasite which can replicate inside any nucleated cells including those of pancreas and induces a T-cell immune response. Type-1 diabetes (T1D) is considered as an autoimmune disease in which T-cell mediated destruction of insulin secreting cells in the pancreas occurs. Thus, theoretically, toxoplasmosis could play a possible role in the development of T1D; therefore, this work was designed. Interestingly, in the case-control study, the seropositivity of anti-*** **Toxoplasma** **IgG was significantly higher among T1D (86.37%) than T2D (66.67%) and the control group (60%). The experimental study included acute and chronic Me49** ***T. gondii*** **infected mice groups in addition to a control group. Pathological examination revealed the presence of** ***T. gondii*** **zoites adjacent to the islets of Langerhans of the acutely infected mice. With chronic infection, there was a significant reduction of islets number and sizes in association with grade-1 insulitis. The immunohistochemical study showed significant infiltration of the islets of chronically infected mice by $CD8^+$ and $CD45^+$ immune cells. In contrary to the control group, the islets of the chronic group showed significantly higher expression of the apoptotic marker caspase-3 and a significantly lower expression of the proliferation marker Ki69. Finally, a significant reduction of insulin expression in the islets of chronic infection group was detected in association with a significant increase in serum glucose concentrations; however, the establishment of diabetes did not occur throughout this work. Thus, this study presents an evidence for the probable role of chronic toxoplasmosis in the development of T1D.**

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