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Electron microscopic studies of fetuses from schizophrenic mothers

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Introduction: Schizophrenia with 1% of prevalence constitutes one of the fundamental problems of public health in the world for its human, social and economic repercussion independently of the temporary or geographical context where it appears. The neurodevelopmental hypothesis in the aetiology and physiopathology of schizophrenia is considered one of the most consistent at present. It is based on a series of evidences that guide toward an affectation in the critical period of the human being development due to pregnancy and delivery complications, particularly those with known or presumed impact on foetal neurological development, that result in increased risk for schizophrenia psychosis. Among the possible etiological candidates are viral infections. A virus acting in this important and critical stage of the development interacting or not with genetic factors can be responsible for the cascade of biological events that appear later on and could explain the period of relative stillness that exists between the birth and the appearance of the symptoms in the puberty that could be related to the reactivation of a latent viral infection. In the present work additional results are presented in an ultrastructural study carried out in samples of the left temporal lobe of foetuses aborted for medical reasons from schizophrenic mothers with strong familial antecedents of schizophrenia. The findings obtained are compatible with an active infection of the central nervous system by herpes simplex hominis type I [HSV1] virus during the second trimester of pregnancy. Until our report evidences supporting the concept of virus-cell interaction in the neurodevelopmental hypothesis of schizophrenia had been indirect. The present results are the first direct evidence that demonstrate the presence of virus particles in the central nervous system of foetuses in the critical period of the second trimester of foetal development. The importance of this finding can have practical applications in the prevention of the illness keeping in mind its direct relation to the aetiology and physiopathology of schizophrenia.

Results: In four of five of the studied foetuses it was observed within the nucleus of neurons the presence of vacuoles with spherical empty particles of 100 nm occupying the centre of an electron-lucid area. The inclusions with particles appeared in number from 2 to 8 per nucleus, with great incidence in their appearance. The size and form of the particles coincides with the observations made of similar particles in the brain of post-mortem studies of adult schizophrenics and in animals experimentally inoculated with cerebrospinal fluid from schizophrenic patients using the same electron-microscopic techniques. The rest of the cells of the nervous system didn't present these particles. No particles were observed in a control study. A positive reaction to herpes simplex hominis type I antigen was observed in immunoelectromicroscopic analysis.

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