In Vivo Treatment With Diphenyl Ditelluride Induces Neurodegeneration In Striatum Of Young Rats

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Organotellurides are important intermediates in organic synthesis and, consequently, the occupational exposure to them is a constant risk for laboratory workers. These compounds can elicit many neurotoxic events in the central nervous system (CNS) that are associated with several neurological symptoms. Central nervous system dysfunctions are among the most significant effects of exposure to diphenyl ditelluride (PhTe) 2 and the glial cells, that play an important role in maintaining neuronal function, are extremely involved with these effects. In this work we investigated the effect of a single subcutaneous injection of diphenyl ditelluride (PhTe) 2 in 15 day-old Wistar rats (0.3 μmol/kg body weight) on parameters of neurodegeneration. Flow cytometry analysis showed that (PhTe) 2 significantly increased the propidium iodide (PI) of NeuN positive cells from injected animals. Otherwise, PI incorporation into GFAP positive cells was not altered in response to (PhTe) 2 injection indicating that in vivo exposure to (PhTe) 2 provoked neuronal death in striatum of rats at day 6 after injection. Immunohistochemical analysis of striatal sections analyzed by confocal microscopy showed a dramatic increase of GFAP positive cells, characteristic of reactive astrogliosis, while immunostaining for NeuN showed neuronal loss. Moreover, Western blot analysis showed activated caspase 3 in (PhTe) 2 treated striatal slices meaning apoptotic cell death. Western blot analysis using anti-Akt antibody showed decreased Akt immunoreactivity however, pGSK-3-β (Ser9) was not altered in (PhTe) 2 injected rats, suggesting that this kinase is not directly implicated in the neurotoxicity of this compound. Therefore, the present results shed light into the mechanisms of (PhTe) 2-induced neurodegeneration in rat striatum.

Keys: Diphenyl ditelluride, AKT, neurodegeneration
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