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Effects of the pesticide Lindane on granulosa cell ultrastructure

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The excessive exposure to pesticides in the Aral Sea area was correlated to the increased reproductive pathologies in those regions [1]. One of the principal chemical employed was the gamma-hexachlorocycloexane herbicide Lindane (L), a persistent organochlorine that may induces alterations in granulosa cell (GCs) survival [2, 3]. However, a comprehensive experimental study on the L-induced dose-effect morphological alterations, has not yet addressed. Therefore, we studied by means of transmission and scanning electron microscopy, the morphological changes of mouse GCs, matured in vitro with increasing concentrations of L [4-6].

GCs showed several dose-dependent changes, in respect to controls. In particular, we observed significant reduction of GC microvilli and decrease of cytoplasmic processes between adjacent GCs. In addition, peripheral aggregation of chromatin under the nuclear membrane, extensive plasma membrane blebbing, abundant GC remnants and cellular debris were also present. Mitochondria, endoplasmic reticula and Golgi apparatuses did not show significant changes. In conclusion, our results showed a dose-dependent toxicity of L on GCs, associated to morphological signs of apoptosis. Alterations of GCs may be associated to impaired oocyte competence and sterility [7].

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Keywords

Lindane; sterility; granulosa cells; ultrastructure; mouse.