15 - Imaging

PO-029 - (23959) - PESTICIDE LINDANE-INDUCED ULTRASTRUCTURAL CHANGES IN MOUSE OOCYTES

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Lindane, a persistent organochlorine pesticide and endocrine disruptor, is associated with female reproductive disorders, including infertility. As a gap-junction blocker, it impairs folliculogenesis by affecting oocyte-directed follicle organization. It can abolish the meiotic spindle formation and polar body extrusion in mice, likely through its impact on Granulosa Cells (GCs), calcium homeostasis, and mitotic spindle assembly. Additionally, Lindane causes ultrastructural damage in mouse parietal GCs, including nuclear membrane invagination, cytoplasmic blebbing, and reduced microvilli. However, its effects on mammalian oocyte morphology remain unexplored. This study investigated the ultrastructural effects of Lindane on mouse oocytes using an in vitro model.

Cumulus-oocyte complexes were cultured with 1, 10 and 100 µM of Lindane and analyzed by Transmission Electron Microscopy. Morphometric analysis of main organelles was performed.

Oocytes exposed to 1 and 10 µM exhibited a progressive decline in mitochondrial numerical density, dilation of the smooth endoplasmic reticulum, depletion of cortical granules, and a reduction in microvilli compared to controls. At 100

μM, these changes were more pronounced, with increased smooth endoplasmic reticulum dilation, frequent vacuolization, autophagic vesicles, rare cortical granules, and irregular distribution of microvilli.

Lindane-induced ultrastructural damages were evident at all tested concentrations, with the most severe effects observed at 100 μM. These alterations may negatively affect oocyte maturation, quality, and embryo development potential. In conclusion, for the first time, this study demonstrates Lindane reproductive toxicity on the ultrastructure of mouse oocytes, providing insights into the harmful effects of environmental toxicants on female fertility and their potential role in rising infertility rates.

Palavras-chave : ultrastructure, oocyte, Lindane