

电磁脉冲对大鼠腺垂体超微结构的影响

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研究观察了电磁脉冲(EMP, 场强 200 kV m^{-1}) 辐照后不同时间大鼠腺垂体超微结构的改变。辐照后 6h 和 12h 时细胞与周围组织间隙增大, 泌乳激素细胞内线粒体明显肿胀、嵴断裂; 生长激素细胞内线粒体空泡化、高尔基复合体扩张、散在的次级溶酶体易见; 其它内分泌细胞也有线粒体肿胀等类似的超微结构改变。辐照后 24h 时常可见细胞间隙内有巨噬细胞浸润, 泌乳激素细胞内出现大量的线粒体空泡化, 核内异染色质增多, 染色质轻度边集; 生长激素细胞部分线粒体内出现同心圆状髓鞘样结构, 双层膜溶解或消失; 促性腺激素细胞内质网扩张连结成网状; 促肾上腺皮质激素细胞及促甲状腺激素细胞亦出现线粒体嵴断裂乃至空泡化等超微结构改变。辐照后 48h 时可见垂体组织内大量的炎细胞浸润, 细胞水肿更加明显。泌乳激素细胞核扭曲、变小, 核内出现大量的团块状异染色质, 大部分边集于核膜下; 生长激素细胞内出现大量的次级溶酶体; 促性腺激素细胞内质网扩张成片; 促甲状腺激素细胞变性、坏死。

本工作发现 EMP 辐照可引起腺垂体内分泌细胞超微结构的改变, 主要表现为线粒体和粗面内质网的损伤改变, 且损伤在辐照后 48h 内呈逐渐加重趋势; 泌乳激素细胞和生长激素细胞可能为 EMP 辐照损伤的敏感细胞。

关键词 电磁脉冲, 大鼠, 腺垂体, 超微结构

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Effect of electromagnetic pulse (EMP) on ultrastructure of pituitary gland in rats

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The work is to observe ultrastructure of pituitary gland of rats exposed to electromagnetic pulse (EMP, 200 kV m^{-1} , 200 times) with transmission electron microscope and to explore the effects of EMP on the endocrine system. At 6h and 12h after EMP exposure, the intercellular spaces were dilated, swollen mitochondria with cristae loss, dilatation of Golgi complex and diffused lysosomes were found in endocrine cells of pituitary gland, especially in prolactin cells and growth hormone cells. There were macrophages infiltrating in intercellular spaces at 24h after EMP exposure, and more mitochondrial vacuolization in prolactin cells, many myelin figures in growth hormone cells and distinct dilatation of endoplasmic reticulum in gonadotropic cells were found. These changes were gradually aggravated. Numerous secondary lysosomes, the gathering of heterochromatins under the nuclear membranes, and cell degeneration and necrosis could be observed at 48h. These results suggest that EMP may damage endocrine cells in pituitary gland of rats, mitochondria and endoplasmic reticulum are the sensitive organelles, and prolactin cells and growth hormone cells are perhaps the sensitive cells to EMP.

KEYWORDS Electromagnetic pulse (EMP), Rat, Pituitary gland, Ultrastructure

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