

交叉学科

低剂量连续辐射引起的小鼠免疫系统的变化

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摘要

为了评估低剂量X射线连续辐射对BALB/c小鼠健康机体免疫系统的影响, 实验采用X射线全身连续照射BALB/c小鼠, 照射第一天剂量为0.07 Gy, 剂量率0.2 Gy/min, 之后每天照射0.08 Gy, 共照射12 d, 累积剂量1.03 Gy, 照射后24和48 h取血、胸腺和脾脏。流式细胞仪检测免疫细胞周期和凋亡的变化, 胸腺和脾脏指数用重量法获取。实验结果表明, 小鼠胸腺细胞的周期在照射后24 h被阻滞在G2/M期; 外周血淋巴和胸腺细胞周期48 h被阻滞在 G0/G1期, 细胞凋亡比例在照射后两个时间点都显著增加; 脾脏淋巴细胞周期24 h被阻滞在 G0/G1期, 48 h被阻滞在 S期, 细胞凋亡比例在24和48 h显著减少; 脾脏指数在照射后48 h显著减少。故低剂量X射线连续全身照射BALB/c小鼠可激活免疫细胞不同的周期监测点, 引起免疫细胞凋亡比例发生变化, 造成一定的辐射损伤, 且这种影响随着免疫器官的不同而不同。

For estimating the effect of low doses X ray continual irradiation to immunity system of mouse, BALB/c mice were continually irradiated to 1.03 Gy by X rays at a dose rate of 0.2 Gy/min in 13 d. At 24 or 48 h after irradiation, the immunocyte cycle and apoptosis were determined by flow cytometry, and the thymus and spleen weights were measured too. The results showed that the cycle of thymocyte were arrested in G2/M at 24 h, the number of peripheral blood lymphocytes and thymocytes in G0/G1 phase at 48 h was up and the percentage of apoptosis had a significance increase in both of time points; the cycle of spleen lymphocytes was delayed in G0/G1 at 24 h, in S phase at 48 h, the apoptosis had a significance decrease at 24 and 48 h; spleen index declined significantly at 48 h. The results suggested that low doses continual X ray whole body irradiation could activate different cell cycle checkpoints, and result in some changes of apoptosis and some damages to immunocytes. The continual X ray irradiation affects the organs differently, it might provide experiment basis for radioprotection.

关键词 [X射线连续辐射](#) [免疫细胞](#) [细胞周期和凋亡](#) [脾脏和胸腺指数](#) [小鼠](#)

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