EUROPEAN RADIATION RESEARCH 2012



Contribution ID: 84

Type: oral (15 minutes)

The effects of Electromagnetic pulse on migration of T lymphocytes

Tuesday, 16 October 2012 18:00 (15 minutes)

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* This work is supported by National Natural Science Foundation of China, No. 30972430 and 81072272.

Background: It has been found in our previous study that electromagnetic pulse (EMP) could increase the lymphocyte number in murine spleen and inhibit proliferation of splenocytes, which suggests EMP induced accumulation of lymphocytes in spleen. This study was aimed to evaluate the effects of EMP on T lymphocyte migration.

Methods: Balb/c mice were exposed to EMP radiation. The in vitro migration directed by chemokines SDF-1 and CCL5 of T lymphocytes from spleen, thymus was evaluated with transwell assay.

Results: The mice received 200 times of irradiation of 200 kV/m EMP and sacrificed at designated time points. In vitro migration assays revealed that EMP increased migration of splenocytes and thymocytes to SDF-1 and CCL5. The enhanced effects of EMP emerged 1d after radiation, reached to its peak at 7d after EMP radiation. In another experiment, the mice were exposed to 200 kV/m of EMP radiation with different exposure times (100-400 times) and migration assays were performed 7d after radiation. It was shown EMP could improve T lymphocyte migration in a dose-dependent manner.

Conclusion: EMP radiation could increase chemotaxis of T lymphocytes in time-dependent and dose-dependent manners, suggesting that EMP could improve the recruitment of T lymphocytes to inflammation sites and thus influence the adaptive immunity. It will be interesting to further explore the underlying mechanisms. Keywords: electromagnetic pulse (EMP); chemotaxis; lymphocyte; SDF-1; CCL-5

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Session Classification: Non-Ionizing Radiation

Track Classification: Non-Ionizing Radiation