INFLUENCE OF CHEST GAMMA–IRRADIATION ON COUGH RESPONSE IN AWAKE GUINEA PIGS

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Introduction: Radiotherapy of tumors in the chest and neck regions may have serious pulmonary side-effects. It is known that inflammation is the essential manifestation of radiation-induced injury, and it may progress to irreversible complications.
Aim: The aim of this study was to find out whether chest gamma-irradiation would have any effects on cough reaction intensity (CRI).
Material and methods: Guinea pigs (Trick strain, n=32;) were used in the study. Animals were divided into two subgroups. Animals of A subgroup (SG-A, n=14; M=7, F=7) were submitted to sham chest irradiation. The chest of animals in B subgroup (SG-B, n=18; M= 9, F=9) was exposed to a single 12 Gy dose of gamma rays. Cough was provoked by exposure of animals to citric acid aerosol in gradually increasing concentrations (0.05- 1.6M). The cough test was done two days before sham/real irradiation, than 1, 3, 10, 15, 21, and 28 days after sham/real irradiation. CRI was measured by counting number of coughs. Differences in CRI between animals in SG-A and SG-B in the selected days after irradiation were evaluated. Differences in CRI between pre-irradiation and post-irradiation periods in SG-B were evaluated, too.
Results: A significant increase of CRI was found in animals of SG-B 10 days after irradiation compared with the CRI in SG-A animals. A significant increase of CRI was also found within SG-B 10 days after irradiation when the pre-irradiation to post-irradiation values were compared.
Conclusions: The chest gamma-irradiation leads to CRI changes. The CRI is significantly increased 10 day after irradiation.