

## Effect of ionizing radiation on rat parotid gland: a morphoquantitative study

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A common factor associated with radiotherapy used in the treatment of oral cancer is ionizing radiation of the salivary glands, which results in structural alterations and physiological changes, such as decreased salivary flow. The serous acinar cells of the salivary glands are the cells that are the most sensitive to the effects of ionizing radiation. Therefore, due to the placement of the parotid gland, as well as the fact that the parenchyma contains a large quantity of acinar cells, the gland is the main target of disturbances caused by ionizing radiation. Doses higher than 1000 cGy are sufficient to promote alterations in the glandular parenchyma of rats as soon as six hours after irradiation. The aim of the present study was to evaluate structural and quantitative alterations in the parotid gland acinar cells of Wistar rats submitted to ionizing radiation. 20 male Wistar rat, weighing between 250 and 350 g, were randomly selected for study. Group I received no ionizing radiation. Radiation doses in the remaining groups were as follows: group II: 750 cGy non-fractionated; group III: 1000 cGy non-fractionated; group IV: 1500 cGy non-fractionated; and group V: 1500 cGy in fractionated doses. Animals were anesthetized through intramuscular injections of 35 mg.kg<sup>-1</sup> of ketamine, 5.0 mg.kg<sup>-1</sup> of xylazine and 0.75 mg.kg<sup>-1</sup> of acepromazine. The animals were then exposed to radiation by Gamma particle emission from a Cesium-137 radioactive fountain positioned at a distance of 20 cm from the skin surface. The animals were sacrificed with an overdose of ketamine and the parotid glands were removed. Results: From a quantitative point of view, size distribution of the nuclei of acinar cells in GROUP I samples was heterogeneous, ranging from 5 to 50 micrometer, taking into consideration that the highest percentage of nuclei measured was 96.7%. Decreased nucleus size was found to be directly proportional to the dose level of the ionizing radiation. In GROUP II, 94.9% of nuclei were measured, ranging in size from 5 to 40 micrometer and showing a considerable decrease in maximum size. The great majority (62.66%) of the nuclei measured fell within the 10 to 25 mm. On the other hand, when compared to those from GROUPS I and II, nuclei of acinar cells in GROUP V samples showed a marked decrease in size. The 97.6% measured ranged in size from 5 to 30 mm. Of those, 60.27% measured between 10 and 20 mm. The cellular kind, involved with higher frequency due to the effect of ionizing radiation, are the acinar cells. The fractionated dose, showed be the best methodology of administration of radiation, once it allows using high doses, causing a lower biologic damage in organism. The limit of radiation doses, to application in single doses, as showed the methodolog.