

AKTIVITAS SUPEROKSIDA DISMUTASE, KATALASE DAN KADAR MALONDIALDEHIDA KELENJAR SUBMANDIBULARIS TIKUS WISTAR SETELAH IRADIASI SINAR GAMMA

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(SUPEROXIDE DISMUTASE AND CATALASE ACTIVITIES AND MALONDIALDEHIDE LEVEL IN RAT SUBMANDIBULAR GLANDS AFTER GAMMA-RAY IRRADIATION)

ABSTRACT

Background. A common side effect of radiotherapy used in the treatment of head and neck cancers is the occurrence of structural and physiological alteration of the salivary gland due to exposure to ionizing irradiation, as demonstrated by conditions such as decreased salivary flow. Ionizing irradiation cause burst of reactive oxygen species (ROS) such as ions superoxide, hydroxyl radicals and hidrogen peroxide which induce activation of self-defense system such as superoxide dismutase and catalase. If this defense system could not diminish the excessive amount of ROS it would lead to oxidative stress which can be determined by rise of malondialdehyde (MDA) levels. **Purpose.** The aim of this study is to find out the effects of single and fractionated dose of gamma ray irradiation on superoxide dismutase and catalase activities and malondialdehyde levels in rat submandibular glands at 24 hours, 3 weeks and 6 weeks after gamma ray irradiation. **Method.** This was an experimental laboratory study with post-test only control group design. Sixty male Wistar rats aged 3-4 months (250-300 g) grouped into three. Group A (20 rats) as control group were not irradiated. Group B (20 rats) were irradiated with single dose (10 Gy) and group C (20 rats) were irradiated with fractionated dose (10 Gy in 5 fraction of 2 Gy/day) of Co⁶⁰ Gamma ray, with their neck ventral surface exposed to the source. The rat submandibular glands were extirpated at 24 hours, 3 weeks and 6 weeks after irradiation and then analysed for superoxide dismutase and catalase activities using microreader and malondialdehyde levels using spectrophotometer. **Result.** At evaluation time 24 hours, 3 weeks and 6 weeks after 10 Gy gamma ray irradiation both in single dose and fractionated dose the superoxide dismutase activities were lower than in the control group (p : 0,598), the catalase activities were higher than in the control group (p : 0,159) except at 24 hours after the single dose irradiation the catalase activity was lower than in the control group (p : 0,000) and the malondialdehyde levels were higher than in the control group (p : 0,069).

Keywords. superoxide dismutase activity, catalase activity, malondialdehyde levels, rat submandibular glands, gamma ray irradiation.