

**Calcium Homeostasis in Type I Diabetes: Effects of Ionizing Radiation**

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**PURPOSE:** Enhanced oxidative stress is implicated in various forms of tissue injury ranging from radiation-induced cell damage to autoimmune destruction of islet beta cells. Diabetes mellitus is associated with disorders in calcium homeostasis and bone turnover resulting in the development of osteopenia. Moreover, ionizing radiation has been documented to affect the regulation of calcium metabolism. Thus, there is potential interest in the possibility that ionizing irradiation can aggravate abnormalities of calcium homeostasis in diabetics. **METHODS:** Diabetes was developed by subcutaneous injection of alloxan (80 mg/kg bw) and was manifested by hyperglycemia and insulinopenia. Diabetic and normal rats were irradiated at dose of 100 cGy (Cs-137, 0.45 Gy/min). Oxidative stress and calcium metabolism were evaluated in 3, 10 and 30 days after radiation exposure. **RESULTS:** Oxidative stress measured as TBARS level was significantly intensified in alloxan-treated and irradiated groups. Ionizing radiation reduced considerably serum calcium and phosphate in diabetic rats. Despite low alkaline phosphatase isoenzymes activity in irradiated rats, hyperphosphatasia was observed in diabetics exposed to radiation. Calcium-regulating hormones, both calcitonin and parathyroid hormone, were significantly elevated in irradiated animals with diabetes compared to control. **CONCLUSION:** Ionizing radiation showed synergistic effect on alterations in calcium homeostasis of diabetic rats and thus may contribute to the bone complication of diabetes through increased oxidative stress.