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Exposure of Rats to Whole Body Gamma Rays Induces Early Alterations in Biliary Secretion

of

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
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Abstract: Aim: To study the effects of whole body gamma irradiation on bile flow and bile composition in rats. Methods: Three groups of male Sprague-Dawley rats were irradiated with a single 8 gray (Gy) fraction for 15-20 min and examined for bile secretion at different time intervals (18, 48, 72 h) after irradiation. For collection of biliary secretions, rats were anesthetized with intraperitoneal (i.p.) urethane (1.25 g/kg) and equipped with biliary cannulas inserted into the bile duct through the sphincter of Oddi. Bile was collected for 4 h following bile duct cannulation. Bile flow (bile-pancreatic juice) and biliary excretion of total proteins, cholesterol and total lipids were measured. Biliary activities of the hepatocellular alanine aminotransferase (ALT), aspartate aminotransferase (AST), and the canalicular enzyme alkaline phosphatase (ALP) and biliary excretion of glucose were also assessed. Results: After an 8-Gy fraction, no significant alterations occurred in bile flow. Biliary total protein concentration and outputs were significantly decreased following gamma irradiation, with 29.3% and 34.7% reductions in rats examined 72 h post-irradiation. Biliary total cholesterol and lipid concentrations and outputs were also significantly decreased, with the reduction being most marked during the 18 h-48 h post-irradiation measurement period. Biliary activity of ALT increased at 72 h post-irradiation, while that of AST was decreased at 48-72 h post-irradiation. Biliary ALP activity was significantly increased by the 2nd day post-irradiation. Biliary glucose secretion, which was very low in control rats, showed progressive increase over the study period and peaked at 48 h post-irradiation, coinciding with the increase in biliary ALP efflux. Conclusions: Exposure of rats to whole body gamma rays induces early alterations in biliary secretion.

Key Words: Whole body gamma irradiation, bile secretion, rats

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