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Use of selected chelating agents to mobilize radiocesium from the body

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Examinations were carried out to compare the effects of Prussian Blue (PB), Ca-gluconate, and Na-citrate on removal of radioceasium from male Wistar rats. The animals were randomly divided into 5 groups of 10 animals each. Radioceasium was administered by intragastric intubation to all tested rats for 5 concecutive days with a daily dose of 20 kBq. Animals in group 1 (the controls) were administered only ceasium-137 chloride whereas animals in groups 2 to 5 were subjected to the same radioceasium schedule as rats in group 1 and then treated as follows: groups 2 and 3 were given PB by gastric intubation at a dose of 20 mg in 0.5 mL of distilled water 1 hr or 1 hr and 5 hr, respectively, after ceasium-137 contamination whereas rats in group 4 after each PB treatment were subsequently injected ip for 5 consecutive days with a daily dose of 20 mg of sodium citrate and calcium gluconate in 0.5 mL of distilled water. Rats in group 5 were treated similarly to rats in group 4 but without PB administration. Animals were killed 6 days after termination of the experimental protocol. The whole-body retention of ceasium-137 was measured in a well type scintillation counter. Mean values were compared by Student's t-test. Prussian Blue, Ca-gluconate and Na-citrate failed to produce any unfavourable effects on body weight gains and organ to body ratios of the liver, kidneys, heart, and testes in all rats tested. Control rats retained 71.2% of administered radioceasium in the whole-body. Fivefold and tenfold administration of PB or fivefold treatment with PB plus 5 injections of Na-citrate and Ca-gluconate decreased significantly the whole-body retention of radioceasium to 49.7%, 38.4%, and 43.2%, respectively. On the other hand, fivefold treatment with Na-citrate and Ca-gluconate (witout PB treatment) faild to decrease radioceasium retention in comparison to that in the controls. The present results showing a high efficiency of Prussian Blue in removal of radioceasium from animal bodies are in accordance with earlier reports of others. On the other hand, no effects of Ca-gluconate and Na-citrate injection on radiocaesium mobilization from the body were in contrast to the opinion that citrate and gluconate enhance the removal of radioceasium from animals.

Primary authors: Dr GROSICKI, Andrzej (National Veterinary Research Institute, Department of Radiobiology, Pulawy, Poland); Mr RACHUBIK, Jarosław (National Veterinary Research Institute, Department of Radiobiology, Pulawy, Poland)

Presenter: Dr GROSICKI, Andrzej (National Veterinary Research Institute, Department of Radiobiology, Pulawy, Poland)

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