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Removal of ^{60}Co and ^{65}Zn from the Mammalian Body

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The mobilization of both radionuclides by the Ca-chelate of diethylenetriaminepentaacetic acid (DTPA) is a well-established fact[1-3]. The actual fraction of the body burden which can be removed, however, is relatively small. This is due to the fact that the coordination compounds formed by Zn and Co with endogenous ligands are rather stable and/or inert[4,5]. The present study aims at the elucidation of the question whether a higher efficacy can be achieved with the Co- and Zn-chelates, respectively, i.e. by isotopic exchange.

Adult rats of the Heiligenberg strain were injected intravenously with carrier-free $^{60}CoCl_2$ or $^{65}ZnCl_2$. The body burden following the intraperitoneal administration of Ca-, Zn- and Co(II)-DTPA[6], respectively, was determined and expressed as % of the radioactivity in control animals. Obviously, as can be seen from the Table, the principle of isotopic exchange is more effective than chelation.

At this juncture, it may be mentioned that the apparent retention of ^{65}Zn observed after administration of Zn-DTPA labelled with ^{65}Zn[7-9] is due not only to an instability of Zn-DTPA in the physiological milieu and a

Radioactivity of the whole body 48 h after the administration of the chelates. Averages of 5 (^{60}Co) and 6 (^{65}Zn) animals per group

Treatment	% of control (95% confidence limits)
200 μM Na_3Ca-DTPA 6 h after ^{60}Co	90 (70–107)
200 μM Na_3Co-DTPA 6 h after ^{60}Co	60 (50– 71)
512 μM Na_3Ca-DTPA 168 h after ^{65}Zn	91 (88– 94)
512 μM Na_3Zn-DTPA 168 h after ^{65}Zn	80 (77– 83)

corresponding *genuine* Zn-retention. In view of the above mentioned findings, it is most likely that the isotopic exchange also in this case plays a significant role.

Zusammenfassung. Trägerfreies ^{60}Co(II) und ^{65}Zn wurden Ratten intravenös injiziert. Bei nachträglicher intraperitonealer Applikation der entsprechenden nichtradioaktiven und durch DTPA chelierten Isotope werden erheblich grössere Radionuclidmengen aus dem Körper ausgeschieden als nach Verabfolgung von Ca-DTPA. Isotopischer Austausch ist somit wirksamer als Chelierung.

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