TRANSFER OF ^{144}Ce VIA PLACENTA AND DURING LACTATION TO OFFSPRING IN MICE

A. NEHARIN and E. LUBIN

Soreq Nuclear Research Center, Israel Atomic Energy Commission, Yavneh, Israel

Abstract—This investigation is a continuation of a similar study on the transfer of $^{152-4}Eu$ to the offspring in mice. Our main interest is the case of an acute contamination occurring a long time before the pregnancy. The question is whether the radioisotope, that has already been fixed in the bone, is removed during pregnancy or lactation, and, if so, in what quantities in relation to the time elapsed since contamination.

Four experimental groups, each of 12 female mice, were injected with 3 μCi/0.2 ml of ^{144}Ce–citrate. An additional group was held as control. The groups were mated to untreated males by the harem method.

Group A was mated and the isotope administered on the 18th day of gestation. The animals were sacrificed on the 20th day, the total period of gestation being 21 days and the ^{144}Ce content determined in the whole litters, uterus and placenta, blood (0.5 ml), liver, femur and remaining carcass. These measurements showed the transfer of the contaminant to the fetus through the placenta, very shortly after the contamination has occurred, and also distribution of the isotope in the various organs.

Group B was mated immediately after dose administration. The offspring were whole-body counted for body burden soon after delivery. Thereafter the lactating litter was counted in the same manner twice a week until weaning, after which 3 more counts were taken during the next 5 weeks. From this group mainly the transfer of the contaminant through the milk was determined.

Groups C and *D* were mated 4 and 8 weeks respectively after injection of the isotope. The offspring were counted for body burden as in Group B, to indicate the effect of the time elapsed since contamination on the transfer to the offspring during pregnancy and lactation.

Results

1. The transfer of the contaminant through the placenta, expressed as a percentage of the mother's body burden, at the time of delivery was clearly related to the time elapsed since the date of contamination.
2. The transfer of the contaminant through the milk was considerable. Lactating litters showed a gradually rising body burden which reached a peak on the 11th day and then dropped rapidly till the weaning day. Three more counts taken during the next 5 weeks showed a very small and gradual decrease.
3. The transfer of ^{144}Ce to the lactating litters was higher the closer the gestation period was to the day of the administration of the isotope.
4. The body burden of the contaminant showed a somewhat quicker decrease in the lactating mothers than in the virgin females.
5. The distribution of ^{144}Ce in the offspring was measured in the period of maximal activity and found to be mainly in the digestive tract.