LETTER TO THE EDITOR

The renal radiation dose produced by using ^{197}Hg Neohydrin is still considered as being very reduced.

The first results on this subject were published in 1964 by Desgrez *et al.* (1), who established a radiation dosage to the kidneys of 1.2 rads for 1 mCi ^{197}Hg, and Sodee (2), who proposed the amount of 4.37 rads for the same quantity. Today these reduced calculated values seem explainable to us through the total or partial overlooking of the characteristics related to the decay of the radionuclide. (Sodee has began to search the problem, inexhaustively, however, and, as a result obtained the low figure of 4.37 rads.)

Starting from these data there is a general opinion that ^{197}Hg produces a reduced kidney absorbed dose. We find this opinion commonly shared in papers published or communicated even during 1966 (3, 4, 5).

Meanwhile, however, two studies were published, by Harris *et al* in 1964 (6) and by Smith *et al* in 1966 (7), in which, although they do not actually calculate the absorbed dose, all the premises for a correct plotting of this dose are set down. Indeed, they state precisely the necessity of taking into account both the secondary effects of electronic capture and the internal conversion with its consequences. It seems therefore all the more surprising that today this dosage is still underestimated.

Unpublished calculations carried out earlier in our laboratory, taking into consideration the processes occurring during the decay of ^{197}Hg had shown us that the dose is seven to eight times higher than the figures commonly admitted.

The appearance of the remarkable study of Smith *et al.* (7) simplifies the problem considerably by clearly stating the total local energy deposition per disintegration $E\beta$, which has to be taken into account in the case of ^{197}Hg, as being 79.4 keV. Under these circumstances, the application of the classical formulae (8) show for 1 mCi ^{197}Hg Neohydrin a kidney absorbed dose of (9):

$$\begin{aligned} D_\gamma &= 0.0346 \cdot \Gamma \cdot C_o \cdot g \cdot T_{eff} = 2.7 \text{ rads} \\ D_\beta &= 73.8\, E_\beta \cdot T_{eff} \cdot C_o = \underline{31.5 \text{ rads}} \\ &\text{Total} \quad 34.2 \text{ rads} \end{aligned}$$

representing quite an appreciable value. To this has to be added also the absorbed dosage to the kidneys produced by the constant pollution with ^{203}Hg of the preparations. For instance, for a five per cent pollution in the above mentioned example, we have to add about another 10 rads. Evidently, in conditions in which preparations with an initial pollution of 0.1% begins to be produced, the importance of this factor will be reduced.

Under these conditions, we think that the mentioning of a small renal radiation dose should no longer constitute a basic argument in the discussions about the utilisation of ^{197}Hg Neohydrin in medical practice.

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