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Human biodistribution and radiation dosimetry of 82Rb.

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Abstract

Prior estimates of **radiation**-absorbed doses from (82)Rb, a frequently used PET perfusion tracer, yielded discrepant results. We reevaluated (82)Rb **dosimetry** using **human** in vivo biokinetic measurements.

METHODS: Ten healthy volunteers underwent dynamic PET/CT (6 contiguous table positions, each with separate (82)Rb infusion). Source organ volumes of interest were delineated on the CT images and transferred to the PET images to obtain time-integrated activity coefficients. **Radiation** doses were estimated using OLINDA/EXM 1.0.

RESULTS: The highest mean absorbed organ doses (μGy/MBq) were observed for the kidneys (5.81), heart wall (3.86), and lungs (2.96). Mean effective doses were 1.11 ± 0.22 and 1.26 ± 0.20 μSv/MBq using the tissue-weighting factors of the International Commission on Radiological Protection (ICRP), publications 60 and 103, respectively.

CONCLUSION: Our current (82)Rb **dosimetry** suggests reasonably low **radiation** exposure. On the basis of this study, a clinical (82)Rb injection of 2 × 1,480 MBq (80 mCi) would result in a mean effective dose of 3.7 mSv using the weighting factors of the ICRP 103-only slightly above the average annual natural background exposure in the United States (3.1 mSv).

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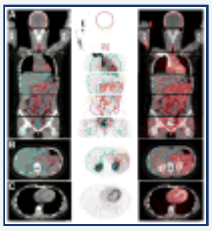

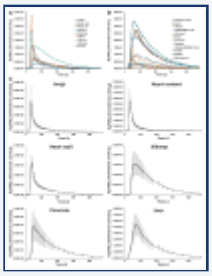

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