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TO THE EDITOR: In a recent *JNM* Newsline article entitled "Scintimammography: Magic Bullet or False Promise" by Deborah Kotz (*J Nucl Med* 1995;36:15N–20N), Dr. Khalkhali from the UCLA School of Medicine in Los Angeles is quoted as saying that the radiation dose to the patient from this procedure " . . . was equal to the amount of radiation a person gets when he/she flies round-trip from New York to Los Angeles." I believe it important to point out that this statement is inaccurate. The total body absorbed dose from an injection of 740 MBq (20 mCi) of ^{99m}Tc-sestamibi used in scintimammography is approximately 3.3 mGy (330 mrad) (*1*). The effective dose rate from background radiation at an altitude of 10 km (33,000 ft.) is 5 μSv/hr (0.5 mrem/hr) (*2*). Since the body is uniformly irradiated, this dose is equivalent to an absorbed dose rate of 5 μGy/hr (0.5 mrad/hr). For a 5-hr commercial airline flight across the United States, the total absorbed dose is thus 25 μGy, or 50 μGy (5 mrad) round-trip. This is a factor of some 66 times lower than the sestimibi absorbed dose.

The situation, however, is actually worse than this. A proper comparison of radiation risk requires comparisons of effective dose (*3,4*) which take into account the differing tissue sensitivities to radiation, and not absorbed dose, which measures only energy deposition per unit mass of tissue and does not include biological factors. Using the appropriate tissue weighting factors (*3,4*) and the absorbed doses from ^{99m}Tc-sestamibi to individual organs (*1*), the administration of 20 mCi of sestimibi results in an effective dose of 570 mrem to women (410 mrem for men), as determined from data presented in Table 4 of the Cardiolite kit. Thus, the ratio of increased radiation risk for scintimammography versus a round trip airline flight coast to coast is closer to 114:1.

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REPLY: We wish to acknowledge the dosimetry comparison error pointed out by Dr. Behrman; the total body absorbed dose from 740 MBq (20 mCi) ^{99m}Tc-sestamibi is indeed about 3.3 mSv (330 mrem) and a cross-country round trip air flight is about 0.05 mSv (5 mrem). The effective dose cited in ICRP no. 62 (*1*) is 5.5 mSv (555 mrem) for exercising adults and 6.20 mSv (629 mrem) for resting adults, which is even higher than Dr. Behrman has calculated.

However, the fact that we have an absorbed dose factor of about 125 between the two sources does not mean that we have a risk factor difference of 125. It is entirely possible, and at this point probable, that chronic absorbed doses of radiation at these low levels engender no risk at all. Indeed, the radiopharmaceutical dose could more easily be regarded as hormetic than hazardous. There are no valid epidemiologic data documenting harm at these low absorbed doses.

The linear, no-threshold hypothesis may have been appropriately conservative in the early decades of our study of the biological effects of ionizing radiation, when a limited amount was known. When a lot of smart people spend much money and a hundred years looking for harm without finding any, it probably is not there. When they occasionally find examples for which low doses exert beneficial effects, after a few decades, it is certainly time to stop hypothesizing the "healthy worker effect," "biological subgroup differences," "confounding variables," or "insufficient sample size" and state the most sensible scientific conclusion: Low doses of ionizing radiation do not appear to have deleterious effects and appear, on occasion, to be beneficial.

The recent work published in *Science* on the DNA repair enzyme system(*2–7*) provides ample evidence for repair of damage from low levels of a variety of environmentally encountered hazardous agents, of which oxygen is perhaps the most hazardous of all. In addition, stimulation of such repair systems by one agent could protect against other hazardous agents and could quite simply account for hormetic effects.

It is time for us to get away from the tired old guard, the antinuclear terrorists, the environmental lawyers and uneducable regulators, and switch paradigms at long last. Try reading Rosalyn Yalow (*8*), Bernard Cohen (*9*) and Zbigniew Jaworowski (*10*). Delve into T.D. Luckey's 1991 textbook *Radiation Hormesis* with over 1000 references(*11*). We think it most probable that the emperor has no clothes.

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