

Letter to the Editor

Appropriateness of Pediatric Radiopharmaceutical Doses

Goetz and Hamilton (1) recently compared actual pediatric radiopharmaceutical doses (extracted from MODS data) with theoretical maximum pediatric doses calculated based on weight. They reported that the vast majority of actual pediatric doses exceeded theoretical maximum doses during the 1977–1978 MODS sample period. Furthermore, they reported that limited data obtained in 1984 indicate that actual pediatric doses still usually exceed theoretical maximum doses.

Although pediatric doses of ^{99m}Tc polyphosphate/pyrophosphate in the MODS sample were excessive, I think that they may be greatly overestimating the extent of the problem with most other radiopharmaceuticals. I attribute this primarily to their questionable choice of maximum recommended values for adult radiopharmaceutical doses. For example, when analyzing the MODS data, their maximum recommended adult doses for liver imaging with ^{99m}Tc -sulfur colloid and vascular flow brain imaging with [^{99m}Tc]pertechnetate or DTPA were 3 mCi and 15 mCi, respectively. During this period, however, maximum adult doses recommended by the FDA as indicated in package inserts for these radiopharmaceuticals were 8 mCi and 20 mCi, respectively (2–4). Thus, theoretical maximum pediatric doses for these indications would be proportionately higher and would encompass a larger fraction of actual pediatric doses.

Similarly, when analyzing the 1984 data, their recommended adult doses for bone imaging, liver/spleen imaging, and renal imaging were 15 mCi, 6 mCi, and 5 mCi, respectively. However, maximum adult doses recommended by the FDA as indicated in package inserts for radiopharmaceuticals used for these studies are 20 mCi, 8 mCi, and 20 mCi, respectively (5–9). When theoretical maximum pediatric doses for these studies are recalculated using these higher maximum recommended adult doses, excessive actual pediatric doses were administered in only 4/33 of the cases instead of 25/33 as reported by Goetz and Hamilton.

In summary, I believe that the majority of pediatric radiopharmaceutical doses are appropriate. Hopefully, educational efforts in progress will even further reduce the occasional instances of excessive radiopharmaceutical dose administrations in pediatric patients.

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Reply

The major issue addressed in our paper (1) is not the latest maximum radiopharmaceutical adult dose specified in the current package insert or any effort to change those values, but rather how to calculate an appropriate pediatric radiopharmaceutical dose. Actual pediatric experience from the MODS survey illustrated that calculations of pediatric radiopharmaceutical dose using less than the recommended maximum value still produces quality diagnostics.

The initial paper “In Vivo Diagnostic Nuclear Medicine Pediatric Experience” (2) used the maximum recommended radiopharmaceutical adult dose from the *Physicians Desk Reference for Radiology and Nuclear Medicine*, Medical Economics Company, 1978. Both papers were written to generate interest within the nuclear medicine community to review procedures of calculating pediatric radiopharmaceutical dose, and thereby encourage the reduction of unnecessary administration incidences.

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