Plasma-Volume and Red-Cell Mass Determinations

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LETTERS TO THE EDITOR

PLASMA-VOLUME AND RED-CELL MASS DETERMINATIONS


It gave me pleasure to learn that these investigators finally have accepted the fact that the Fco, ratio is important and that both plasma and red-cell volume should be measured separately to measure total blood volume accurately (1). It is also pleasant to find that the “Unitag” bag I developed (2,3) is finding its place and that banked O-Rh-negative tagged cells are utilized (4). In recent years we have modified the Unitag technique so that it is simpler and much more economical. We use sterile plastic gradient beads for rapid separation of red cells from plasma.

We have always condemned the use of precalibrated syringettes containing radioactive iodinated albumin, and I am glad to read that the authors feel the same way about this.

Very few readers are aware that we were the first to develop an automated blood-volume computer (5—7). I am sure that in due time the authors will realize that it is more economical and better practice to use a twin-scaler system and a sophisticated calculator, both of which cost less than an automated instrument. The twin-scaler system is more versatile and reliable.

As to the simplicity of the technique described, we have some reservations because we went through such a phase in the past few years. It is worth remembering that errors in technique multiply as the number of steps in the procedure increase. The technique we described in the Journal of Nuclear Medicine (8) is simple, practical and economical. The two tracers, 51Cr and 125I are measured simultaneously on whole blood in syringes.

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REFERENCES


CHOICE OF ISOTOPE FOR THYROID SCANNING

In a recent Journal of Nuclear Medicine article, Atkins and Richards demonstrated the value of 99mTc-pertechnetate for thyroid scanning (1). We feel, however, that their conclusions, “the use of 99mTc-pertechnetate is recommended both for physiological and anatomical studies of the thyroid,” may be premature if routine clinical use is contemplated because they compared pertechnetate with 131I and not with an iodine radionuclide that is preferable for rectilinear scanning, namely, 123I. Using equipment designed for 131I, we showed that the resolution obtained with 123I was superior to that with 131I (2), and our results have been duplicated in numerous laboratories (3). When collimators and crystals are used which are specifically designed for the low-energy x-rays emitted by 123I, the superiority of this nuclide is even more convincing (see Figure).

In the past two years, such a low-energy collimator has become commercially available (4). If the aluminum “can” housing the standard 3 X 2-in. sodium iodide crystal is modified to take a 10-mil window, the counting rate over the thyroid gland with 123I using this collimator is approximately 4 to 5 times the counting rate obtained with an equivalent dose of 131I. Thus if a patient with a 24-hr radioiodine uptake of 20% is given 100 @c of 123I, an epithyroid counting rate of approximately 15,000 cpm is usually obtained. Although this is only half the counting rate reported by Atkins and Richards with pertechnetate (using their specially constructed collimator), a speed of 50 cm/min with this counting rate will produce a scan of high technical quality.

Our experience with pertechnetate for thyroid scanning has been limited, but we have been impressed with the high neck background, not normally a feature of 123I scans. Although this back-