

A WAY TO "OPTIMIZE" EXISTING BRAIN SCANNING AGENTS

The search for a better brain scanning agent has in the past three years increased in momentum, which is as it should be; certainly no pharmaceuticals to date can be considered anywhere near optimum. It would appear from recent work by Konikowski, Glenn, and Haynie (1,2) that although no superb agent is present, it might be possible that existing agents can be "optimized." The data of these investigators clearly show that a relationship exists between the plasma level of the radiopharmaceutical and the quantity of uptake in the tumor. Implied is the probability that the degree of plasma protein binding also affects the lesion-to-background ratio. From the data shown, none of the compounds studied would appear to have arrived within the brain tumor by either carrier-mediated active transport or facilitated transport. The tumor-to-blood, tumor-to-brain, tumor-to-skin, and tumor-to-muscle ratios, all of which are vitally important in brain scanning, reflect mainly the rate of removal of isotope from the plasma. Of great importance is Fig. 7 (1). If one uses percent radioactivity remaining in the tumor at any finite time postinjection as one index of how well the tumor might be detected by scanning, as shown in this figure, the rate of fall of isotope dose from that tumor becomes of great importance. When one compares this figure to Fig. 1 (1), it is obvious that the rate of decrease in isotope dose in the tumor is considerably slower than the rate of fall of isotope in the plasma. This would suggest that

the best way to get a high tumor-to-background ratio would be to use a continuous intravenous infusion of isotope into the patient for "X" period of time to maintain a high plasma level of the radiopharmaceutical, followed by the intravenous injection of a rapid-acting diuretic, i.e., ethyrcinic acid. Along with this, high oral or intravenous infusion of fluids would be in order. Under these conditions, any ionic substance such as pertechnetate or others in which tubular re-absorption plays a part in the clearance from the body by the kidney could be removed at a relatively rapid rate and thus allow higher lesion-to-background ratios than we can obtain with a single injection technique. With attention to the patient's clinical condition, this is a safe procedure and could be handled on the clinical wards. Certainly, the M.D. Anderson model would serve well to show the desirability of using this technique.

SAMUEL E. HALPERN
University Hospital
San Diego, California

REFERENCES

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AUTHORS' REPLY

We have read the Letter to the Editor by S. E. Halpern with great interest. We are appreciative of his comments relating to our recent publications. We are continuing our efforts along these lines. Our interests lie both in evaluating the agent and in optimizing the conditions of use. Therefore, we found Dr. Halpern's suggestions of great value. Although the M.D. Anderson mouse model system probably could not be adapted to the constant infusion technique, it can be used to evaluate some of his other ideas.

This letter conveys our thanks to Dr. Halpern for his suggestions, and to the *Journal of Nuclear Medicine* which makes this forum possible.

T. KONIKOWSKI
H. J. GLENN
T. P. HAYNIE
The M.D. Anderson Hospital
Houston, Texas