

▶ Radiopharmaceuticals in Radionuclide Therapy

E. Mantel (Philadelphia)

Radionuclide therapy has evolved over the years, but the basic theory remains the same. Radionuclide therapy uses ionizing radiation to kill or shrink abnormal cells and tumours by damaging the cell's DNA, which causes the cells to stop growing. By inhibiting cell growth, both palliative therapy and improved patient prognosis can be achieved. It is the beta emitting isotopes, which provide the greatest therapeutic radiation dose. The advantages of this growing arsenal against various cancers are the relatively non-invasive nature of the treatment options currently available.

Isotopes such as I-131 are commonly used in its natural state. However, the exciting opportunities lie in combining these isotopes with site-specific tracers such as metaiodobenzylguanidine (MIBG), Lipiodol, or Tositumomab to deliver the maximum cell destruction potential with the least amount of adverse reactions to the patient. By destroying targeted site-specific cancerous lesions, the patient suffers the least total cell damage, which limits adverse side effects and maximizes positive outcomes.

Other isotopes such as Y-90, P-32, Re-186, and Er-169 are currently in use today. These products are combined with site-specific chemical compounds to direct the beta radiation to a desired location within the body to provide appropriate therapeutic results.

It's interesting to note a novel radiation dose delivery method such as with Y-90 microspheres. These can be used in patients with non-resectible hepatomas and liver metastases. Just as important are agents used in palliative treatment of patients with radioisotopes such as Sr-153 and Sr-89.

Clearly, radioisotopes will have an increasingly important role in the battle against all types of cancer.

References

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