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Short Communication

Evaluation of Drug Conjugates and Precision Therapy for Potential use with Radiopharmaceuticals

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DESCRIPTION

A drug contains many radioactive substances which are used to diagnose and treat diseases such as cancer. Radiopharmaceuticals can be used to find cancers such as Bone metastases (when cancer spreads to bone). There are also radiopharmaceuticals that are used to diagnose health problems other than cancer. They can be administered to patients in many ways, for example, they can be administered orally, by injection, or placed in the eye or bladder. However, at low doses, the radiation dose received by the human body is very low and is considered safe. High doses of these drugs to treat the disease can have a variety of effects on the body.

One type of radiopharmaceutical is called radioimmunotherapy. This treatment combines a small amount of radioactive material with a special drug called a monoclonal antibody. The radioactive material acts as a tracer that can find and attach to cancer cells, and the monoclonal antibody is delivered directly to the cells. Radiopharmaceuticals are radioactive isotopes attached to biomolecules that can attack specific organs, tissues, or cells in the human body. The number of radiopharmaceuticals in clinical use is increasing rapidly, giving the medical community greater access to detailed information on the characteristics of different types of tumors.

The dose of radiopharmaceuticals used to diagnose medical problems varies from patient to patient and depends on the type of examination. Safety measures may be necessary to protect people around us from body-wide radiation. This is because radioactive materials leave the body through saliva, sweat, blood, and urine, making these body fluids radioactive [1]. When deciding on a diagnostic test, the risks and benefits of running the test must be weighed. Certain medicines should not be used before or after eating or eating certain types of foods as interactions can occur. The use of alcohol or tobacco and certain drugs can also cause interactions. Radiopharmaceuticals do not usually require special precautions when used for small diagnostic purposes.

Nuclear medicine is a medical specialty that uses radiopharmaceuticals that have proven to be very useful allies to medicine, helping in a variety of diagnoses and treatments, especially cancer [2]. Nuclear medicine uses radioactive substances in the body to study how organs and tissues are functioning (diagnostic) or to attack and destroy damaged or diseased organs and tissues (therapeutic). The first widely used radiopharmaceutical was iodine-131, a simple salt form of the cleavage product of sodium iodide, whose use was introduced in the late 1940s as a diagnostic test for certain thyroid disorders.

A nuclear medicine specialist may give patient-specific instructions on how to prepare for the test. For example, some tests require several hours of fasting. Failure to do so may affect test results. Other tests require drinking plenty of fluids. If the patient does not understand the instructions or has not received the instructions, consult a nuclear medicine specialist beforehand. Nuclear medicine is a specialty of radiology that uses trace amounts of radioactive substances or radiopharmaceuticals to study the function and structure of organs [3]. Nuclear medicine imaging is a combination of many different disciplines. In addition to the desired effects, drugs can have some unwanted effects.

Radiopharmaceuticals are regulated by the United States because they contain radioactive material. Also, since radiopharmaceuticals are prescription drugs, they are under the control of the United States Food and Drug Administration (USFDA). When radiopharmaceuticals adhere to cancer cells, the radioactive compounds are naturally degraded [4]. This collapse releases energy that damages the DNA of neighboring cells and when a cell's DNA is damaged beyond repair, the cell dies. Cancer cells are particularly sensitive to radiation-induced DNA damage. Radiopharmaceutical Therapy (RPT) involves the targeted delivery of radiation to tumor cells or the tumor microenvironment [5]. This treatment approach differs from external beam radiation therapy and brachytherapy in that the radiation is delivered by unencapsulated radionuclides. Over 100 radiopharmaceuticals have been developed using radioisotopes produced by research reactors or cyclotrons. The manufacture of radiopharmaceuticals involves the handling and chemical processing of large amounts of radioactive material [6]. Radiopharmaceutical development costs are significantly higher

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than therapeutic agents and are subject to a very lengthy and expensive approval process.

CONCLUSION

Radiopharmaceutical therapy is currently used to treat metastatic prostate cancer, thyroid cancer, and well-differentiated neuroendocrine tumors. Researchers are developing and testing new radiopharmaceutical therapies to treat other types of cancer. The widespread use of radiopharmaceuticals today makes side effects important. Adverse reactions observed with liver radiopharmaceuticals are commonly nausea, vomiting, erythema, erythema, extensive rash, pruritus, urticaria, respiratory symptoms, and fever and rare cases of death have been reported.

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