

CANCER DRUGS AND ^{99m}Tc -GLUTATION RADIOPHARMACEUTICAL INTERACTION TO ACHIEVE OPTIMAL RESULT OF CANCER DIAGNOSTICS IN NUCLEAR MEDICINE

Cancer is one of the leading causes of death in the world, including Indonesia. By 2030, it is estimated that cancer sufferers reach 26 million people and 17 million dies from cancer, with a faster increase in developing countries. The application of nuclear techniques in nuclear medicine plays an important role in diagnosing cancer, measuring therapy responses, and identify an optimal therapy. PSTNT - BATAN has contributed to the development of diagnostic kits, one of which is ^{99m}Tc -Glutation. Utilizing these diagnostic kits, there is a tendency to increase the risk of drug interactions consumed by cancer patients with diagnostic kits that can lead to misinterpretation of data. This study aims to investigate the possible alteration in the bioactivity of ^{99m}Tc -Glutation when given in combination with cancer drugs in Balb/C strain mice (*Mus musculus*). The study was divided into four groups of normal and model animals test. Each group is differentiated by treatment, i.e. control (I), animals test with doxorubicin treatment (II), methotrexate (III), and 5-fluorouracil (IV). Each drug is intravenously, after 5 minutes it is injected with ^{99m}Tc -Glutation intravenously. Furthermore, the pharmacokinetics, biodistribution, and toxicity tests were carried out. Interpretation of blood kinetics data shows changes in blood kinetics, that the distribution half-life of ^{99m}Tc -Glutation in mice that given cancer drugs has accelerated and the elimination half-life has decelerated. While the data of biodistribution test showed a significant decrease in the target / non-target biodistribution ratio, from 7.06 to 1 (normal animals) and 2.93 to 0.42 (model animals). The results can certainly cause misinterpretation of diagnosis data. Whereas the toxicity test in normal animals and model animals by observing 14 days after injection. The results of observations of physical abnormalities after injection of ^{99m}Tc -Glutation radiopharmaceuticals showed that no pathological changes. The results of this study are expected to provide benefits to clinicians in nuclear medicine in order to achieve an accurate diagnosis so it has a positive impact on the patients.

Keywords: drugs interaction, cancer, diagnostic kits, ^{99m}Tc -Glutathione

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