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DEVELOPMENT OF PRELIMINARY CLASSIFICATION SYSTEM FOR DRUG RELATED PROBLEM IN PATIENTS RECEIVING RADIOPHARMACEUTICALS BASED ON PCNE SYSTEM V9.1

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ABSTRACT

Background: Radiopharmaceuticals are radioactive drugs utilized for both diagnostic and therapeutic purposes. The significant benefits of radiopharmaceuticals to patient management have been recognized and the usage is expected to increase in the future. In order to optimize the desired outcome benefit in patients receiving radiopharmaceuticals, drug related problems (DRP) associated with them should be identified and managed accordingly. However, the data on DRP in this group of patients are still limited. A classification system for drug related problem is necessary to allow the identification and documentation of drug related problem in a systematic way. The lack of requirements for unique properties of radiopharmaceuticals in currently available classification systems could make the identification of DRP to be difficult.
Objective: This study is aimed to identify the types of drug related problem associated with radiopharmaceuticals and develop a preliminary classification system for drug related problem in patients receiving radiopharmaceuticals.
Methods: The DRPr are identified through a systematic literature search according to PRISMA guidelines. Electronic databases (Medline and Web of Science) and Google search are conducted to identify the DRPr. By analysing the identified DRPr, a preliminary classification system is developed from adaptation of Pharmaceutical Care Network Europe (PCNE) System for DRP V9.1.
Results: The results of this study show 62 types of DRP in patients receiving radiopharmaceuticals identified in the literature which includes imaging problems, altered biodistribution, adverse drug reactions, drug-radiopharmaceutical and food-radiopharmaceutical interaction, drug selection problems, dosimetry problems, and administration problems. A preliminary classification system is developed with addition of several categories and subcategories that are missing in the PCNE System V9.1 to fit with the classification of DRPr. The items for category of the preliminary classification system includes treatment effectiveness, treatment safety, imaging problems, altered biodistribution, drug selection, dose selection, preparation and formulation, drug use process, patient related, dosimetry and other.
Conclusions: The identified DRPr in the literature would potentially serve as a new insight for healthcare professionals regarding the occurrence of DRPr. Healthcare professionals should report and properly document any DRPr that occurs in nuclear medicine department. The developed preliminary classification system can be utilized to identify DRPr in nuclear medicine and facilitate its development for further refinement in future research.

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CHAPTER ONE
INTRODUCTION

1.1 Research Background

Drug related problem (DRP) is defined as an event or circumstance involving drug therapy that actually or potentially interferes with desired health outcomes (definition PCNE,1999). DRPs can lead to prolonged hospitalization, increase patient morbidity and mortality, and increase health care burden. DRP such as medication errors can occur in all branches of medicine, all phases of caregiving and all pharmaceutical categories (Mohseni & Wong, 1998). In hospitalized patients for example, 10-30% of patient admissions were related to drug related problems (Gayathri et al., 2018). The common DRPs that have been identified in hospitalized patients include drug interactions, untreated indications, over dosage and drug used without a valid indication (Gayathri et al., 2018).

The identification and management of DRPs are important for optimizing patient care and it is also a part of the pharmaceutical care process. Since the introduction of the concept of pharmaceutical care by Hepler and Strand, the pharmacist's responsibilities have changed from a product orientation to patient care orientation by ensuring optimal drug therapy and patient safety (Berenguer et al., 2004). Some of the activities of pharmaceutical care have been promoted, including identifying potential and actual drug related problems, resolving actual problems, and preventing potential problems. Pharmaceutical care services can reduce drug-related morbidity and mortality, adverse drug reactions, length of hospital stay, and cost of therapy. Since then, various studies have been done to identify DRP along with pharmacist led intervention and the results had shown positive outcomes. For example, a study that identified, resolved, and prevented DRP in a hospital setting could enhance patient drug compliance and patient therapeutic outcomes (Biradar et al., 2017).

A classification system of DRPs is a tool that has been developed to assist pharmacists and other healthcare professionals to identify, resolve and document the occurrence of DRPs in the clinical setting. There are more than 20 DRP classification systems used worldwide that have been developed with different focuses. Some DRP