

RESEARCH ARTICLE

Propofol Quantification method in Palm Oil Based Nanoemulsion Formula using RP-HPLC

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ABSTRACT:

HPLC is one of the methods that is widely used for the routine determination of drug content in a pharmaceutical dosage form. The objective on this research was to develop a simple method to determine the propofol concentration in a new formulation using a palm oil-based nanoemulsion carrier system (NEMS™ MCT/LCT). The method used was reverse phase high performance liquid chromatography (RP-HPLC) using a C18 column with methanol and water (80:20) as the mobile phase and UV wavelength detection was 276 nm. The retention time obtained for the drug in NEMS MCT/LCT was 6.32 min. This was similar to the retention time of the standard. The correlation coefficient value from the calibration curve was 0.9998. The drug contents were 100.90% and 100.24% for the 1% and 2% NEMS MCT/LCT, respectively. The result indicated that the RP-HPLC method used for the analysis of propofol in the palm oil-based emulsion system was able to accurately determine the concentration of the drug. This method is suitable for routine determination of propofol concentration in palm oil-based emulsion formulations.

KEYWORDS: Palm oil, NEMS, LCT, MCT, Propofol, HPLC.

INTRODUCTION:

Propofol (Fig. 1) is commonly used in the induction and to maintain anaesthesia in surgical patients¹. The drug is also administered in intensive care unit patients². Some of the advantages of propofol are the rapid onset of hypnosis^{3,4} and minimal side effects¹. Propofol is also shown to be effective in the prevention of emesis⁵ and the treatment of pruritus⁶.

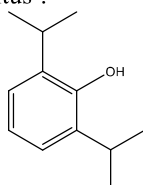


Fig. 1: Chemical structure of Propofol

The use of palm oil in parenteral pharmaceutical formulation is still new. Palm oil commonly known as cooking oil^{7,8}. Malaysia and Indonesia are the major producers of palm oil⁹, both are contributing to more than 90% of the world's palm oil production¹⁰. A palm oil-based nanoemulsion system was successfully developed as a carrier system for the parenteral delivery of propofol¹¹. This formulation is a combination of long chain triglycerides (LCT) and medium chain triglycerides (NEMS™ MCT/LCT). This oil combination in propofol development was success reduce the pain intensity when the injection was performed in rats¹². Nanoemulsion system is a method that regard as carrier for insoluble drug like propofol and also for drug targeting reason^{13,14}.

The RP-HPLC method used in the determination of propofol in NEMS™ MCT/LCT was a modification of the method used by Trapani et al.¹⁵. A reverse phase HPLC system is one of the analysis methods of choice due to the easiness, accurateness and suitable for all