4037002 PYPT/M : MAJOR : PHARMACEUTICS ; M.Sc. in Pharm. (PHARMACEUTICS)
KEY WORDS : DEHP / LEACHING / PLASTIC / PVC / SORPTION
SORAWIT POTHIKIT : INTERACTION OF MODEL DRUGS WITH PLASTIC INTRAVENOUS ADMINISTRATION SYSTEM : FACTORS AFFECTING DRUG AVAILABILITY. THESIS ADVISORS : POJAWON LAWANPRASERT, Ph.D., NARONG SARISUTA, Ph.D. 210 P. ISBN 974-664-309-6

Plastic materials used in medicine and pharmacy may interact with medical substances principally by sorption. For example the sorption of drugs into intravenous fluid containers, delivery sets and other plastic apparatus have been well publicized. Additives present in the plastic materials such as plasticizer can leach out from the finished plastic materials and be responsible for contamination of containers' contents. An example includes the familiar leaching of the plasticizer di-2-ethylhexyl phthalate (DEHP) from polyvinyl chloride (PVC). As for the factors affecting availability of a drug after flowing through an intravenous administration set (IV set), it was found that the extent of model drug loss was flow rate, tubing length, solute concentration, and type of IV set dependent. In the sorption study, isosorbide dinitrate, nitroglycerin, and amphotericin B were chosen. The percentage remaining of isosorbide dinitrate solutions after flowing through 50 cm-long plastic tube cut from IV set was 89-90% of initial concentration within the first 2.5 minutes and then the percentage remaining was increased to 99% of initial concentration within 8 hours. A similar result was found for nitroglycerin solutions. For amphotericin B solution, the percentage remaining of the drug was 98-99% of initial concentration from the first minute to 8 hours. The percentage remaining of isosorbide dinitrate solutions, and nitroglycerin solutions after being stored in 100 mL IV fluid container within 7 days was more than 90% of initial concentration. For amphotericin B solution, the percentage remaining was more than 90% of initial concentration within 2 days but it was precipitated on the fifth day. It was found that DEHP leached from IV set during rinsing with 10 mL of ethanol : water (1:1), and ethanol but leaching was not found with water, 5% dextrose in water or 0.9% sodium chloride rinsing solution. Leaching of DEHP during continuous flow was not found in all infusion solutions within 8 hours. The results obtained in this study appear to be applicable in medical practice since it will provide an insight into a pattern of loss of selected drugs into plastic. Hence procedures used to prevent or decrease loss of these drugs into plastic intravenous administration systems may be established.