

“Lipid emulsions (LEs) used in modern parenteral nutrition formulations are indispensable sources of calories and (essential) fatty acids ((E)FAs). Several generations of LEs based on various FA sources have been developed, and issues related to their safe use deserve attention” Wanten (2015).

Reference:

Wanten, G.J. (2015) Parenteral lipids: safety aspects and toxicity. World Review of Nutrition and Dietetics. 112, p.63-70.

Abstract:

Lipid emulsions (LEs) used in modern parenteral nutrition formulations are indispensable sources of calories and (essential) fatty acids ((E)FAs). Several generations of LEs based on various FA sources have been developed, and issues related to their safe use deserve attention. The relevant issues concern LE composition, stability and sterility, while other problems are related to the lipid infusion rate, including hypertriglyceridemia and lipid overload syndrome. The FA structure of LEs translates into effects on inflammatory processes and immune cell function and affects the functions of organs, such as the liver and lungs. In addition, disturbed balances of (anti)oxidants and the presence of other bioactive agents in LEs, such as phytosterols, are mechanisms that may underlie the potential adverse effects. Lipid emulsions (LEs) are key components of parenteral nutrition (PN) that bypass the need for (essential) fatty acids ((E)FAs) and provide sufficient energy to decrease the need for the infusion of large amounts of dextrose, thus preventing its associated complications. The oldest available LEs are based on soybean oil (SO-LE) and meet these requirements. (Pre)clinical evidence suggests that various, next-generation LEs based on alternative oil sources are safe and effective; particularly, those based on fish oil (FO-LEs) have less pro-inflammatory characteristics that may convey beneficial effects on the immune system and organ functions. With the exception of decreased liver damage with the use of FO-LEs instead of SO-LEs, the clinical relevance of many of these data needs further validation.

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