



The availability and use of new IV lipid emulsions in PN should encourage the clinician to review lipid metabolism based on the quantity of fatty acids provided in specific parenteral lipid emulsions and the expected impact of these lipid emulsions (with quite different fatty acid composition) on measured fatty acid profiles” Gramlich et al (2015).

Abstract:

The fatty acids, linoleic acid (18:2 ω -6) and α -linolenic acid (18:3 ω -3), are essential to the human diet. When these essential fatty acids are not provided in sufficient quantities, essential fatty acid deficiency (EFAD) develops. This can be suggested clinically by abnormal liver function tests or biochemically by an elevated Mead acid and reduced linoleic acid and arachidonic acid level, which is manifested as an elevated triene/tetraene ratio of Mead acid/arachidonic acid. Clinical features of EFAD may present later. With the introduction of novel intravenous (IV) lipid emulsions in North America, the proportion of fatty acids provided, particularly the essential fatty acids, varies substantially.

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We describe a case series of 3 complicated obese patients who were administered parenteral nutrition (PN), primarily using ClinOleic 20%, an olive oil-based lipid emulsion with reduced amounts of the essential fatty acids, linoleic and α -linolenic, compared with more conventional soybean oil emulsions throughout their hospital admission. Essential fatty acid

profiles were obtained for each of these patients to investigate EFAD as a potential cause of abnormal liver enzymes. Although the profiles revealed reduced linoleic acid and elevated Mead acid levels, this was not indicative of the development of essential fatty acid deficiency, as reflected in the more definitive measure of triene/tetraene ratio. Instead, although the serum fatty acid panel reflected the markedly lower but still adequate dietary linoleic acid content and greatly increased oleic acid content in the parenteral lipid emulsion, the triene/tetraene ratio remained well below the level, indicating EFAD in each of these patients. The availability and use of new IV lipid emulsions in PN should encourage the clinician to review lipid metabolism based on the quantity of fatty acids provided in specific parenteral lipid emulsions and the expected impact of these lipid emulsions (with quite different fatty acid composition) on measured fatty acid profiles.

Reference:

Gramlich, L., Meddings, L., Alberda, C., Wichansawakun, S., Robbins, S., Driscoll, D. and Bistrain, B. (2015) Essential Fatty Acid Deficiency in 2015: The Impact of Novel Intravenous Lipid Emulsions. JPEN. 39(1), p.61S-66S.

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