Therefore, our aim was to evaluate the phytonadione content in different IVFE" Forchielli et al (2015).

Abstract:

Background: Intravenous fat emulsions (IVFE) with different fatty acid compositions contain vitamin E as a by-product of vegetable and animal oil during the refining processes. Likewise, other lipid-soluble vitamins may be present in IVFE.

No data, however, exist about phytonadione (vitamin K1) concentration in IVFE information leaflets. Therefore, our aim was to evaluate the phytonadione content in different IVFE.

Materials and Methods: Analyses were carried out in triplicate on 6 branded IVFE as follows: 30% soybean oil (100%), 20% olive-soybean oil (80%–20%), 20% soybean–medium-chain triglycerides (MCT) coconut oil (50%–50%), 20% soybean-olive-MCT-fish oil (30%-25%-30%-15%), 20% soybean-MCT-fish oil (40%-50%-10%), and 10% pure fish oil (100%). Phytonadione was analyzed and quantified by a quali-quantitative liquid chromatography–mass spectrometry (LC-MS) method after its extraction from the IVFE by an isopropyl alcohol–hexane mixture, reverse phase–liquid chromatography, and specific multiple-reaction monitoring for phytonadione and vitamin d3 (as internal standard). This method was validated through specificity, linearity, and accuracy.

Results: Average vitamin K1 content was 500, 100, 90, 100, 95, and 70 µg/L in soybean oil, olive-soybean oil, soybean-MCT coconut oil, soybean-olive-MCT-fish oil, soybean-MCT-fish oil, and pure fish oil intravenous lipid emulsions (ILEs), respectively. The analytical LC-MS method was extremely effective in terms of specificity, linearity ($r = 0.99$), and accuracy (coefficient of variation <5%).

Conclusions: Phytonadione is present in IVFE, and its intake varies according to IVFE type and the volume administered. It can contribute to daily requirements and become clinically relevant when simultaneously infused with multivitamins during long-term parenteral nutrition. LC-MS seems adequate in assessing vitamin K1 intake in IVFE.

Reference:

Forchielli, M.L., Conti, M., Motta, R., Puggioli, C. and Bersani, G. (2015) Phytonadione Content in Branded Intravenous Fat Emulsions: A Comparative Study of 6 Products With Different Fat Sources Using Liquid Chromatography–Mass Spectrometry. JPEN. June 3rd. .

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