

STABILITY OF LIPIDS IN PARENTERAL NUTRITION PRODUCTS ADMIXED WITH NANO-IRON MEDICINAL DRUG

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Abstract

Methods Quantitative analyses: UHPLC-UV with Luna C8(2) column in gradient mode (H₂O:AcN 95% to 5%). Qualitative analysis: 3D-field ultraviolet-visible spectrum. Pure standards were used, and two derivatization agents were tested (2,4-dinitrophenylhydrazine (DNPH) and 3-methyl-2-benzothiazolinone-hydrazone (MBTH)). Smofkabiven[®]-EF was used as PN standard.

Results: Methods for quantifying lipid peroxidation were developed, utilizing similar experimental conditions but different derivatizing substances. The DNPH exhibited satisfactory peak symmetry and linearity, whereas the MBTH approach demonstrated superior precision with the retention time. Both had high analytical sensitivity, with a detection limit of < 50 µg/ml for each substance, and specificity, with no spectral or chromatographic interferences.

Conclusion: When supplemented in PN, the proper integrity of all substances is crucial to achieve the highest benefit for the patient in terms of safety and efficacy. We proposed a reliable method to quantify lipid peroxidation, a potentially limiting factor for the combination of PN with nano iron medicinal drugs. The next step is to investigate the impact of various commonly used iron products in different concentrations on the lipid stability in PN products.

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