

Twenty-nine day study of stability for six different parenteral nutrition mixtures

ABSTRACT

It was concluded that the choice of lipid emulsions depends, for these formulae, on the metabolic and clinical needs of the treated patients.

INTRODUCTION

Introduction Parenteral nutrition is often peri-operative. It can be performed with packages containing different nutrients. Knowledge of the stability of these mixtures is necessary, because the infusion of unstable compounds is potentially dangerous. Since Fujita's animal studies in 1971, it has been accepted that there is a relationship between toxicity and particle size. The predominant factors affecting emulsion particle size seem to be pH, electrolyte concentration, and the amino acid and lipid composition of the mixtures. A reduced stability is indicated by a low zeta potential, which is a standard parameter used to measure the electrostatic repulsion which prevents aggregation and coalescence of lipid droplets. The aim of this study was to test the particle size stability of six parenteral nutrition mixtures fitted to different pathologies (Table 1). The mixtures tested were standard packages, with and without medium chain triglycerides (MCT); packages of low volume for renal or cardiac insufficiency, with and without MCT; packages with low lipid, high protein content with MCT, for mechanical ventilation weaning or stress situations; and high calorie, high protein mixtures with MCT, for situations with high requirements. All the tested formulae were stable for 28 days at 4°C plus 24 h at room temperature.

CONCLUSION

All the stability tests complied — the six ternary unsupplemented controlled mixtures were stable and acceptable for normal therapeutic use after a long storage period, ie 28 days at 4°C, plus 24 h at room temperature. Therefore the choice of triglyceride mixture used is defined solely by the clinical and metabolic requirements of each regimen.