

INFLUENCE OF TIME AND STORAGE CONDITIONS IN THE STABILITY OF NEONATAL TOTAL PARENTERAL NUTRITION ADMIXTURES



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INTRODUCTION

Ternary mixtures in parenteral nutrition have a complex composition. Thus, interactions between those components can occur and lead to instability of the mixture compromising its safety. It is possible that a process of destabilization of the lipid emulsion starts due to aggregation of fat globules.

PURPOSE

To analyse the stability and safety of neonatal total parenteral nutrition admixtures (TPN) as function of globule size, time and storage conditions.

MATERIAL AND METHODS

We studied 8 TPN compositions (100ml) designed following the premature infants protocol in our hospital for TPN prescription and elaboration. All the samples were macronutrients (glucose, lipids and proteins) and micronutrients ternary mixtures, calculated according to the nutritional requirements of a 1Kg neonate during the first 8 days of life. The globule size was measured by Laser Diffraction (Beckman Coulter LS 13 320) on the preparation day (day 0) and after 7 days. The samples were stored at refrigeration and room temperature. Its were prepared in duplicate. We used SPSS v20 program to perform the statistical analysis.

RESULTS

SAMPLE	LIPIDS (g)	GLOBULE SIZE (microns)		
		DAY 0	DAY 7 (ambient)	DAY 7 (refrigeration)
TPN1	0,714	0,373	0,390	0,396
TPN2	1,138	0,401	0,395	0,397
TPN3	1,478	0,257	0,249	0,203
TPN4	1,750	0,250	0,263	0,244
TPN5	2,160	0,270	0,273	0,256
TPN6	2,580	0,266	0,267	0,269
TPN7	2,990	0,269	0,247	0,257
TPN8	4,000	0,256	0,247	0,256

The TPN1 and TPN2 have larger globule size, but the differences are not statistically significant ($p=0.396$) with respect to the rest of the samples.

No significant differences were observed between the globule size at day 0 and day 7 ($p=0.520$).

No significant differences were observed between the globule size of the samples according to the form of storage ($p=0.225$).

CONCLUSIONS

The preliminary results suggest that TPNs with lower lipid concentration have an increase in globule size. We will require confirmation by further experiments. Our results in globule size demonstrate that TPNs are stable and safe during the study period and independently of the storage conditions.

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