Electrolyte disturbances in premature infants with intrauterine growth restriction receiving parenteral nutrition

Laura Gómez-Ganda[a], Carlos Javier Parramón-Teixidó[a], Beatriz Garcia-Palop[a], Marcos Linés-Palazón[b], Felix Castillo-Salinas[b], Albert Blanco-Grau[c], Jose Bruno Montoro-Ronsano[a], Susana Clemente-Bautista[a]

[a] Pharmacy Service. [b] Neonatology Service. [c] Clinical Laboratoy. Vall d'Hebron Hospital, Barcelona, Spain.

Contact data: laura_gomez@vhebron.net

Background and importance

Intrauterine growth restriction (IUGR) in premature infants can promote the occurrence of **electrolyte disturbances**. Some authors propose a **modification of parenteral nutrition (PN)** in these patients for correcting electrolyte disturbances.

Aim and Objectives

To evaluate the **association between IUGR and the occurrence of calcium and phosphate disturbances** in a cohort of premature infants receiving PN.

Materials and Methods

Observational retrospective study between January - December 2016.

Inclusion criteria: premature infants with gestational age (GA) < 33 weeks and birth weigth (BW) < 1500 g on PN in the neonatal intensive care unit.

Variables:

- Biodemographic data: sex, GA and BW
- Daily PN composition
- Plasma levels of phosphate (P) and ionized calcium* (Ca) levels during the administration of PN

*We analyzed ionized calcium levels because it does not depend on albumin levels.

The infants were divided into two groups: **IUGR and non-IUGR**.

Hypophosphatemia event: plasma P levels <1.1 mmol/L
Hypercalcemia event: plasma Ca ion levels >1.3 mmol/L

Associations between biodemographic data, daily PN composition, Ca and P levels, hypophosphatemia/hypercalcemia events and IUGR were analyzed by logistic regression (taking into account the influence of potential confounders) using SPSS version 15.0 software package.

Results

	IUGR n = 52	non-IUGR n = 62
Biodemographic data		
Female (n)	33	32
GA (weeks)*	29,39 ± 2,82	27,77 ± 2,10
BW (g) *	1047,13 ± 297,41	1087,42 ± 260,13
PN composition		
Volume (mL/kg/day) *	93,20 ± 16,31	94,78 ± 18,94
Energy (kcal/kg/day) *	59,00 ± 8,61	58,56 ± 7,89
Amino acid (g/kg/day) *	2,96 ± 0,44	2,91 ± 0,34
Calcium (mEq/kg/day) *	1,45 ± 0,28	1,47 ± 0,19
Phosphorus (mmol/kg/day) *	0,68 ± 0,13	0,66 ± 0,14
Plasma levels		
Phosphate (mmol/L) *	1,36 ± 0,34	1,64 ± 0,34
Calcium ion (mmol/L) *	1,20 ± 0,30	1,21 ± 0,25
Events		
Hypophosphatemia (%)	85,48	78,85
Hypercalcemia (%)	34,62	19,35

* Results are expressed as mean± standard deviation.

There was no statistically significant difference between the presence of IUGR and or non-IUGR with respect to sex, GA, BW, PN composition, P and Ca plasma levels and hypophosphatemia events.

- The logistical regression **shows statistically significant relationship between IUGR and hypercalcemia events (p=0.047).**
- Exploring another associations, it's found that **only weight was associated with hypophosphatemia events (p=0.019).**

Conclusions and Relevance

✓ **IUGR group presented more hypercalcemia events compared with non-IUGR group**.

✓ These results suggest that **modification of electrolyte content** of the PN in IUGR group may be a strategy to avoid calcium disturbances.

Abstract number: 4CPS-176