

LETTERS TO THE EDITOR

Refeeding syndrome: a challenging entity

Síndrome de realimentación: una entidad desafiante

V.M. dos Santos¹, L.A.M. dos Santos², T.A.M. Sugai³

Dear Editor,

Refeeding syndrome (RS), a severe entity related to oral, enteral, and parenteral nourishing of patients at nutritional risk, is characterized by metabolic disorders including water and sodium retention, hypophosphatemia, hypomagnesemia, hypokalemia, and disturbances in glycemia, which are related to cardiovascular, pulmonary, muscular, and neurologic symptoms¹⁻⁸. Hypophosphatemia between <0.30 and 0.85 mmol/L may be found among 34 to 52% of patients in critical care units, and constitutes a major electrolyte change in RS; it is the most useful diagnostic clue for diagnosis within 72 hours of the onset of enteral or parenteral artificial nutrition¹⁻⁸. This often underdiagnosed condition affects adults and children evolving with high morbidity and mortality (up to 33%, mainly pediatric cases of *anorexia nervosa*); although with few published cases. SR also occurs in child cerebral paralysis (CP)⁶. Consensual treatment recommendation is that enteral nutrition should be gradually increased over 24-48 hours in patients at high nutrition risk or who are severely malnourished^{1-3,6}.

We read in the last number of the journal *Anales del Sistema Sanitario de Navarra* a case report of an 8-year-old girl diagnosed with CP and RS after enteral nutrition by a nasogastric tube to control

severe hypoglycemia⁶. Her predisposing factors to CP included severe malnutrition with body weight less than 80% of ideal weight, and weight loss greater than 10% in the preceding three months. On admission to the Emergency Unit she presented with poor peripheral perfusion, hypothermia, bradypnea, bradycardia, paleness, hypoglycemia, and respiratory acidosis. Laboratory determinations showed elevated levels of urea, transaminases, and creatine-phosphokinase; hypophosphatemia (0.8 mg/dL), and hypomagnesemia (1.6 mg/dL)⁶. What is worth noting is that the enteral nutrition started with amounts higher than recommended, instead of establishing her nutritional support with a slow and gradual food increment. The progressive increase in her daily enteral nutrition started at 11 days after clinical and laboratory tests normalization; at 17 days with five meals of a diet up to 93 kcal/kg, at 20 days she returned to oral feeding, and tolerated 1,500 kcal/day (or 107 kcal/kg)⁶. Clinically improved for outpatient follow-up, she was discharged 49 days after admission. The authors focused on the high risk RS factors assessment before any nutritional support, and the need for trained professionals to promptly diagnose and treat this condition⁶.

In the context of critical care sceneries and RS risks, some recently published studies also merit mention.

1. Department of Medicine. Armed Forces Hospital and Catholic University. Brasília-DF. Brazil.
2. Advanced General Surgery and Oncosurgery. Institute of Medical Assistance to State Civil Servants. São Paulo-SP. Brazil.
3. American Society of Neurophysiology. Brasília-DF. Brazil.

Corresponding author:

Vitorino Modesto dos Santos
Armed Forces Hospital
Estrada do Contorno do Bosque, s/n
Cruzeiro Novo
70.658-900 Brasília-DF
Brazil
E-mail: vitorinomodesto@gmail.com

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In Israel, 42 critical care nurses answered a questionnaire to evaluate their perceived and actual roles in nutritional care, and the electrolyte disorder monitoring, including hypophosphatemia, and risk factors, consequences, and management of RS¹. This descriptive exploratory study showed a lack of clarity of the nurses' role and insufficient knowledge about supplying accurate nutrition for care critical care patients¹. The authors concluded that the complex tasks involved in RS are best managed by a multidisciplinary team, including nurses and dietitians, with clear role definitions¹.

Brazilian authors had previously evaluated data of 227 patients, 35 of them (15.4%) accomplishing the criteria for acute-phase response (APR). Hypophosphatemia was present in 11.4% of the APR-positive and in 0.5% of the APR-negative patients⁴. As hyperglycemia was more frequent in APR-positive (60 vs 36.8%), the authors concluded that hypophosphatemia may be associated with the hyperglycemia secondary to tissue injury and/or infection⁴, situations often detected in patients under critical care, and more prone to RS.

Another Brazilian retrospective cohort study of 917 adult patients from an intensive care unit evaluated the role of hypophosphatemia as a risk marker for RS, with comparative dosages of phosphorus levels at admission and after starting the nutritional therapy⁸. There was an increase of hypophosphatemia and of RS risk in patients with this therapy compared with oral diet, and malnourished patients had lower levels of serum phosphorus. Parenteral nutrition had significantly higher associations with hypophosphatemia than either enteral nutrition or parenteral nutrition supplemented with enteral nutrition. Based on such findings, the authors recommended monitoring serum phosphorus levels in critical patients before and after starting a nutritional therapy; these patients should have reduction of calories during the correction of electrolytes, mainly of phosphorus⁸.

The information provided here may contribute to reducing the poor outcomes of RS, which is an entity that is often easy to prevent, but that can lead to fatal complications if it is not treated.

Author's contribution

Santos VM, Santos LAM, and Sugai TAM participated on the conception and design, collection and interpretation of data, literature search, and writing and review of the text.

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Conflicts of interest

The authors declare that they have no conflicts of interest to disclose.

Ethical Statement

In writing the manuscript, the authors followed the policy of the Committee on Publication Ethics (COPE).

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REFERENCES

- BEN-TOVIM H, THEILLA M. Role and knowledge of critical care nurses in the assessment and management of hypophosphatemia and refeeding syndrome. A descriptive exploratory study. *Intensive Crit Care Nurs* 2021; 67: 103097. <https://doi.org/10.1016/j.iccn.2021.103097>
- CASTRO MA, MARTÍNEZ CV. The refeeding syndrome. Importance of phosphorus. *Med Clin* 2018; 150: 472-478. <https://doi.org/10.1016/j.medcli.2017.12.008>
- DA SILVA JSV, SERES DS, SABINO K, ADAMS SC, BERDAHL GJ, CITTU SW et al. ASPEN consensus recommendations for refeeding syndrome. *Nutr Clin Pract* 2020; 35: 178-195. <https://doi.org/10.1002/ncp.10474>
- DA CUNHA DF, DOS SANTOS VM, MONTEIRO JP, DE CARVALHO DA CUNHA SF. Hypophosphatemia in acute-phase response syndrome patients. Preliminary data. *Miner Electrolyte Metab* 1998; 24: 337-340. <https://doi.org/10.1159/000057393>
- FRIEDLI N, ODERMATT J, REBER E, SCHUETZ P, STANGA Z. Refeeding syndrome: update and clinical advice for prevention, diagnosis and treatment. *Curr Opin Gastroenterol* 2020; 36: 136-140. <https://doi.org/10.1097/MOG.0000000000000605>
- LEONARDO-CABELLO MT, LLORENTE PELAYO S, PÉREZ GONZÁLEZ D, ANSÓ MOTA M, GARCÍA CALATAYUD S. Síndrome de realimentación en niña con parálisis cerebral. *An Sist Sanit Navar* 2021; 44: 469-474. <https://doi.org/10.23938/ASSN.0949>
- PONZO V, PELLEGRINI M, CIOFFI I, LUCA SCAGLIONE L, BO S. The refeeding syndrome: a neglected but potentially serious condition for inpatients. A narrative review. *Int Emerg Med* 2021; 16: 49-60. <https://doi.org/10.1007/s11739-020-02525-7>
- RIBEIRO AC, DOCK-NASCIMENTO DB, SILVA JM JR, CAPOROSSI C, AGUILAR-NASCIMENTO JE. Hypophosphatemia and risk of refeeding syndrome in critically ill patients before and after nutritional therapy. *Rev Assoc Med Bras* 2020; 66: 1241-1246. <https://doi.org/10.1590/1806-9282.66.9.1241>