

Late onset refeeding hypophosphatemia in context of delayed initiation of Parenteral Nutrition?

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Background

Refeeding syndrome (RFS) is a potentially life-threatening phenomenon that presents with non-specific symptoms. To reduce the risk of RFS, Intensive Care Unit (ICU) guidelines recommend daily monitoring and eventual supplementation of low serum phosphate levels. Recent studies have suggested that temporary nutrient restriction to less than an initial 400 kcal/d (1) or less than 50% of energy target (2) may be lifesaving in patients developing new onset hypophosphatemia early after ICU admission (1)(2). Previously we revealed an incidence of hypophosphatemia of 40% during the first days after ICU-admission, with 5.5% and 13.5% of admissions exhibiting the worrisome combination of hypophosphatemia and high energy intake (target >50% and >400kCal respectively) (3). Since initiation of parenteral nutrition is delayed until the end of the first week in the UZ Leuven mixed ICUs (ITE), we now focus on RFS occurrence in this delayed time frame.

Objective

To determine the incidence of relative hypophosphatemia (a decline in serum concentration > 0,16 mmol/L as compared to the previous day) and concurrent energy intake after a week in ICU, allowing to guide further screening, prevention and research.

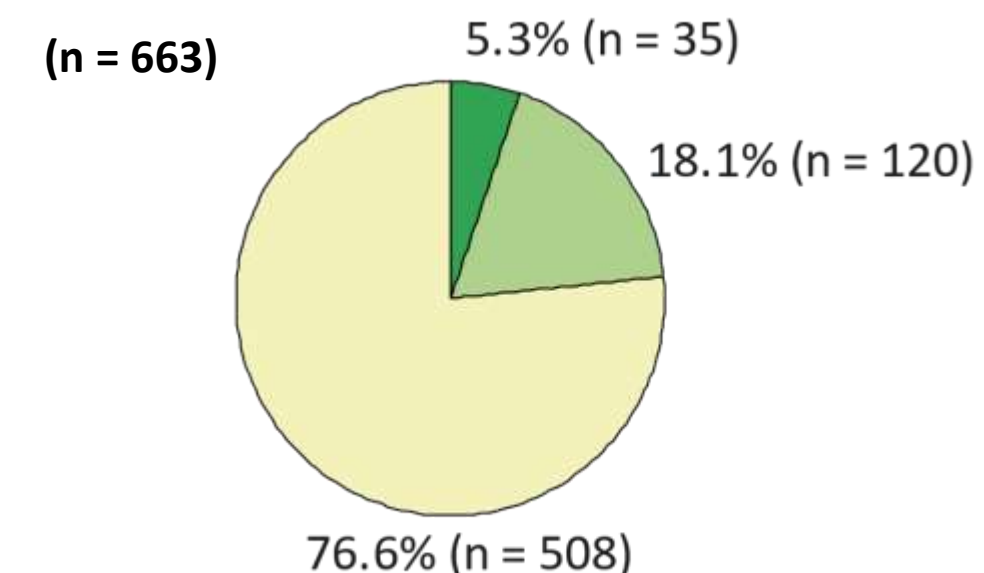
Methods

This is a monocentric retrospective analysis of changes in serum phosphate levels between ICU-day-6, 7 and 8 and caloric intake on ICU-day-8 and 9 obtained for all adult admissions to the UZ Leuven ITE's between September 1, 2022 and December 31st, 2023.

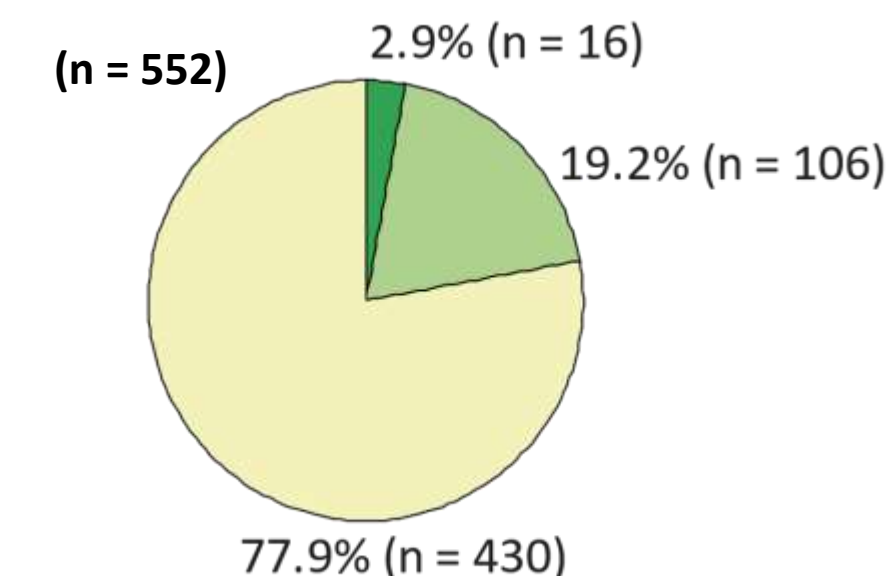
Results

2887 adults were admitted to the ITE's, of which 663 stayed until ICU-day 8 (or beyond) and had phosphate data for ICU-day 6-7.

Co-occurrence of relative RHP on **ICU d7** and caloric intake on ICU d8 \geq 400 kcal

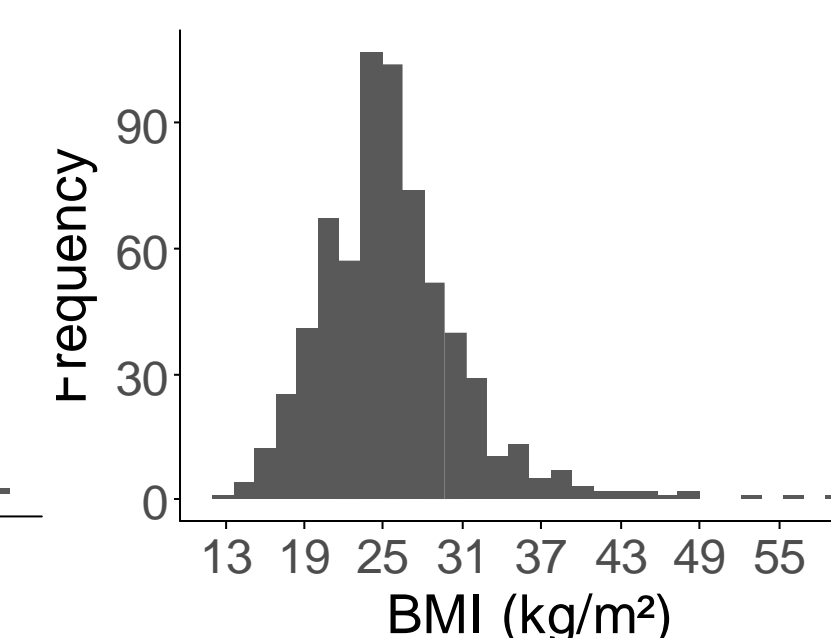
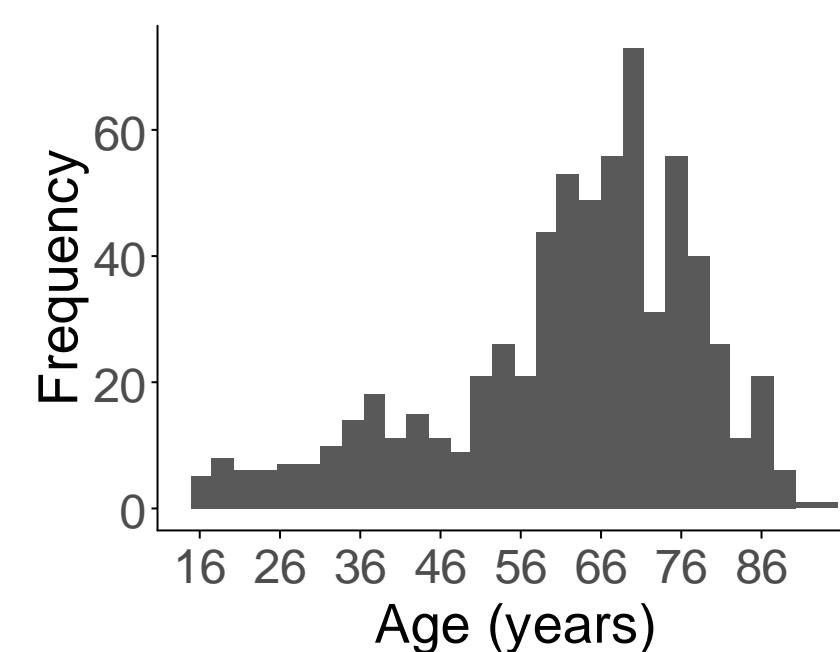


Co-occurrence of relative RHP on **ICU d8** And of caloric intake on ICU d9 \geq 400 kcal.



■ RHP and caloric intake < 400 kcal ■ RHP and caloric intake \geq 400 kcal ■ Patients without RHP

Demographics	Age (mean (± SD))	Gender (M/F)	BMI (mean± SD)
N=663	62 (± 16.1) years	61.4/38.6%	25.7 (± 5.6) kg/m ²



Conclusion

In our study cohort, up to 23.4% of patients were at risk of developing potential refeeding hypophosphatemia, of whom the majority was exposed to the potentially lethal co-administration of more than 400 kcal in the following day.

Sources

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- Olthof LE, Koekkoek W, van Setten C, Kars JCN, van Blokland D, van Zanten ARH. Impact of caloric intake in critically ill patients with, and without, refeeding syndrome: A retrospective study. *Clin Nutr.* 2018;37(5):1609-17.
- Pesonen A, Lauwers C, Casaer MP; Hypophosphatemia and caloric intake in early critical illness A retrospective quality control analysis; Society of Intensive Care Medicine Annual Congress; 2023; Brussels