

Refeeding Syndrome

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ABSTRACT

Refeeding syndrome is defined as the metabolic and clinical changes that occur on aggressive nutrition restoration of malnourished patients. The metabolic changes include: hypophosphatemia, hypokalemia, hypomagnesaemia, sodium retention and hyperglycemia. Hyperglycemia occurs when malnourished patients are fed with excessive amounts of glucose. Whereas the clinical changes cover most organ systems including: cardiovascular, gastrointestinal, musculoskeletal, respiratory, neurological and hematological abnormalities. These clinical changes are displayed in response to the metabolic changes, affecting most organ systems and under severe conditions multiple organ failure may occur leading to death.

Keywords: *Refeeding Syndrome, Malnutrition, Caloric Intake.*

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Under nutrition and starvation causes the body to shift from carbohydrate to fat and protein utilization, in order to produce glucose and energy. Protein turnover, especially protein synthesis, and insulin secretion are reduced in order to conserve energy by reducing basal metabolic rate. Once nutrition (especially carbohydrate) is introduced the metabolism shift back to the utilization of carbohydrate. During this stage, insulin secretion is increased that causes an increase in peripheral tissues (mainly liver and muscles) uptake of glucose and electrolytes (phosphorus, potassium, magnesium) (1).

The intracellular concentration of these metabolites is very limited and their need increases during refeeding to support glucose metabolism as well as the metabolism of other nutrients and metabolic processes. The extracellular content or storage of these electrolytes is very limited and thus fulfillment of their need would depend on their supply of the ingested food. Ingestion of food low in these electrolytes results in a reduction on their concentration causing hypophosphatemia, hypokalemia, hypomagnesemia. At the same time, elevated blood insulin reduces sodium clearance

causing sodium retention and subsequent water retention leading to expansion of the extracellular fluid volume (1, 2).

Vitamin deficiencies also occur due to inadequate intake. Thiamin (vitamin B1) is a cofactor for enzymes needed in carbohydrate metabolism and its deficiency leads to serious consequences during refeeding, for it is rapidly consumed during glycolysis. Thiamin deficiency leads to glucose metabolism impairment that would result in lactic acidosis and further to Wernick's encephalopathy; which is manifested by several symptoms like ataxia, confusion, hypothermia, and coma (3).

Management of refeeding syndrome is so critical and has to be gradual. Caloric intake is increased 10 to 25% in children and adults per day or over 4 to 7 days until caloric needs are met (4). Protein restriction is not restricted, however; high protein intake might spare the lean muscle mass and hence help in its restoration. To prevent fluid overload, sodium and fluid should be restricted initially especially whose cardiac function is compromised (5).

Supplementation for potassium, phosphorus, and magnesium is required, in addition to thiamin and multivitamins. Daily monitoring is required for electrolytes and weekly for pre-albumin and albumin.

When facing a malnourished patient, the direct aim is to start nutrition as soon as possible. However, this might be of great danger as revealed in the article by Weinsier and Krumdiek about the hazards of aggressive feeding (6). In conclusion, it is very crucial to identify patients at risk for refeeding syndrome in order to prevent complications involved while reintroducing nutrition to an undernourished patient.

REFERENCES

1. Kerner A. Refeeding syndrome. *Pediatr Clin N Am* 2009; 56:1201–1210.
2. McCray S, Walker S, Parrish CR Much ado about refeeding. *Pract Gastroenterol* 2005; 29(1):26–44.
3. Mehanna H. Refeeding syndrome-awareness, prevention and management. *Head & Neck Oncology* 2009; 1:1-5.
4. Dunn RL et al. Refeeding syndrome in hospitalized pediatric patients. *Nutr Clin Pract* 2003; 18:327-332.
5. Palesty JA, Dudrick SJ. The Goldilocks paradigm of starvation and refeeding. *Nutr Clin Pract* 2006; 21:147-154.
6. Weinsier RL, Krumdieck CL. Death resulting from overzealous total parental nutrition: the RFS revisited. *Am J Clin Nutr* 1981; 34:393-399.