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Commentary

Metabolic Rebound Risk: Clinical Understanding of Refeeding Syndrome

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DESCRIPTION

Refeeding syndrome is a serious metabolic condition that can occur when nutrition is reintroduced to a person who has experienced prolonged periods of inadequate food intake or starvation. The condition is characterized by shifts in fluids and electrolytes that happen when the body transitions from a catabolic state, where it breaks down its own tissues for energy, to an anabolic state, where it begins using incoming nutrients for energy storage and cellular repair. These changes can lead to significant physiological stress, particularly affecting the cardiovascular and neurological systems.

During prolonged starvation or severe malnutrition, the body adapts by reducing insulin secretion and increasing reliance on fat and protein stores for energy. Electrolyte levels such as phosphate, potassium, and magnesium may appear normal in blood tests during this period because the body has already depleted internal reserves while maintaining serum balance through redistribution. When nutrition, especially carbohydrates, is reintroduced too rapidly, insulin secretion increases sharply. This sudden hormonal response drives glucose and electrolytes into cells, resulting in a rapid drop in their circulating levels.

Phosphate depletion is one of the most concerning features of this condition. Phosphate is essential for the production of adenosine triphosphate, the primary energy molecule in cells. When phosphate levels fall significantly, cellular energy production becomes impaired. This can affect multiple organ systems, including the heart, where reduced energy availability may weaken contractile function. Respiratory muscles can also be affected, making breathing more difficult in severe cases.

Fluid balance changes also play a significant role. The reintroduction of carbohydrates leads to increased insulin levels, which promote sodium and water retention in the kidneys. This can result in fluid overload, leading to swelling, elevated blood pressure, and in severe cases, heart failure. Individuals with pre-existing cardiac or renal impairment are particularly sensitive to these fluid shifts.

Risk factors for developing refeeding syndrome include prolonged fasting, eating disorders such as anorexia nervosa, chronic alcoholism, cancer-related cachexia, postoperative malnutrition, and severe infections leading to reduced intake. Elderly individuals living alone or patients with limited access to adequate nutrition may also be at higher risk. The longer the period of undernutrition, the greater the likelihood that electrolyte reserves are depleted, increasing susceptibility when feeding resumes.

Diagnosis is primarily based on clinical history and laboratory monitoring. A recent history of inadequate food intake followed by the initiation of nutritional support raises suspicion. Blood tests showing reductions in phosphate, potassium, and magnesium after feeding begins support the diagnosis. Continuous monitoring is often necessary during the initial days of nutritional rehabilitation to detect rapid changes in biochemical markers.

Prevention is considered the most effective strategy for managing this condition. Careful assessment of nutritional status before starting feeding is essential. Individuals identified as high risk are usually started on low-calorie feeding regimens that are gradually increased over time. Carbohydrate intake is controlled in the early stages to avoid excessive insulin release. Electrolyte supplementation, particularly phosphate, potassium, and magnesium, is often provided proactively in at-risk individuals.

Management of established refeeding syndrome involves correction of electrolyte imbalances and adjustment of nutritional intake. Phosphate, potassium, and magnesium are replaced according to severity, and feeding rates are often reduced until metabolic stability is restored.

CONCLUSION

Recovery depends on early recognition and appropriate intervention. When managed correctly, most individuals can gradually return to full nutritional intake without long-term complications. However, delayed diagnosis can lead to serious outcomes, particularly in vulnerable patients with pre-existing

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medical conditions. Refeeding syndrome highlights the sensitivity of the human metabolic system to abrupt changes in nutrient availability. Careful clinical management during nutritional rehabilitation is essential to ensure safe recovery in individuals who have experienced prolonged malnutrition. Cardiac monitoring may be required in moderate to severe cases to detect arrhythmias early. Fluid balance is also closely observed to prevent overload.