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Refeeding Syndrome

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ABSTRACT

Refeeding syndrome is a potentially fatal alteration in serum electrolytes occurring in patients refed after a period of starvation. Its actual incidence is not established due to lack of universally acceptable definitions. 88 years lady presented with negligible food intake for 15 days,mild dehydration and a BMI of 16.8kg/m2. Rigorous refeeding was started and patient developed hypophosphatemia, hypomagnesemia and ventricular premature contractions. Patient was diagnosed with refeeding syndrome and treatment was started. She recovered uneventfully and was discharged with nasogastric tube in situ on day 10 of admission. Refeeding syndrome is commonly encountered but mostly overlooked diagnosis and is a significant cause of nutritional morbidity and mortality in patients with chronic malnourishment.

Keywords: Hypophosphatemia; refeeding; refeeding syndrome.

INTRODUCTION

The term refeeding syndrome (RFS),denotes a cascade of metabolic disturbances and clinical symptoms that develops when previously malnourished patients are refed carbohydrates, whether by oral, enteral or parenteral route.[1] First reports of the syndrome appeared in the 1950s after observations of malnourished prisoners of war who developed cardiac and neurological symptoms soon after the recommencement of feeding,[2] who had had a semi-starvation diet of grass, leaves and potato tops, estimated roughly as 800 to 1000 Cal., for 5 to 6 months before capture. Twelve had massive oedema (so-called "wet" beriberi) Intracellular phosphate is generally depleted in chronic malnutrition, on refeeding; abrupt shift to carbohydrate metabolism in response to elevated insulin stimulates cellular uptake of phosphate, which leads to profound hypophosphataemia. [3] We report a case of RFS who presented to a healthcare facility in Kathmandu, Nepal.

CASE REPORT

88 years frail hypertensive lady (under Amlodipine 5mg) presented with complains of diminished food intake since last 6 months,that had increased in severity since last 15 days. She was a known case of depressive disorder diagnosed 2 years back (under Mitrazapine 15 mg). Patient admits to using antacids frequently. No history of alcohol or diuretic use.

On examination, patient was irritable but alert with stable vitals. She was mildly dehydrated. Her BMIwas 16.8 Kg/m^2. Rest of the examination was unremarkable.

Baseline investigation was remarkable for mild hypokalemia (3.4mmol/mol) and uremia (urea: 80mg/dl and creatinine:0.8mg/dl). She was admitted in ICU with diagnosis of Anorexia with Depression.Feeding was started at 350Kcals (approx.) per day with thiamine (200mg/d), and potassium supplements on the day of admission.Feeding was increased to approx. 1590kcals per day on first day of admission.

Patient developed drowsiness on the second day; investigations revealed moderate hypokalemia (2.9mmol/L), hypocalcemia (8.3mg/dL), hypomagnesima (0.5mg/dL), ECG showed new onset tachycardia with ventricular premature contractions. Calcium, magnesium supplements and Tab. Metorpolol 12.5mg was added. Serum phospohorus was sent on subsequent day which was 2.6mg/dl. Serum phosphorus sent 5 days after admission was 2.3mg/dl. Diagnosis of RFS was made and phosphorous containing diet was started (milk, calcium phosphate) in addition to previous medications.

Subsequently, electrolytes were normalized by day 7 of admission and tachycardia and ECG changes resolved.

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Patient recovered uneventfully.

DISCUSSION

RFS is potentially fatal shift in electrolytes that may occur in malnourished patients receiving artificial refeeding.[4] As per a research, out of 178 patients admitted to internal medicine 97 patients(54%) were found to be at risk whereas 14 patients (8%) actually developed the syndrome.[5] Another research showed incidence of RFS in 48% of malnourished patients receiving artificial nutrition enteral or endovenous support and its relationship with mortality.[6] A cohort study was performed in the service of Nutritional Support of the IMSS (Social Security Mexican Institute True incidence of RFS however is unknown owing to the lack of a universally accepted definition.[3] Patients generally at risk are those with anorexia nervosa, alcoholics, frail elderly, chronic antacid or diuretic users, uncontrolled diabetics, and those suffering from chronic malnutrition.[7,3]

Starvation depletes plasma glucose and insulin levels. When feeding is reinstituted, there is rise in plasma glucose stimulating insulin release. Under the effect of insulin, body drives metabolism infavor of glycogenesis, protein and fat synthesis which further depletes electrolytes and vitamins (especially thiamine).[8,]

The key electrolyte abnormalities,(hypophosphatemia, hypernatremia, hypokalemia and hypomagnesaemia) manifest as confusion, respiratory failure, cardiac arrhythmias, and convulsions.[1,9]. Hypophosphatemia is the biochemical hallmark of RFS.[3]

Evidence based guideline regarding the management of such cases was published by NICE in 2006. It recommends feeding in patients who have not eaten for five or more days to be started at 50% of the recommended dietary allowance for at least initial 2 days. Feeding may be increased to normal if there are no biochemical abnormalities detected in the initial two days.[10] Patients at risk for refeeding syndrome should be started at 10Kcal/kg/day increasing slowly to full RDA at 4 to 7 days. In extremely high risk patients it should be started at 5kcal/kg/day continuously monitoring for cardiac arrhythmias. Additional supplement for thiamine (100mg BD or IV), potassium (2-4mmol/kg/day), Phosphate (0.4-0.6mmol/kg/day) and Magnesium (0.2mmol/kg/day IV or 0.4mmol/kg/day oral) needs to be used to maintain serum electrolytes within the normal limits.[10]

CONCLUSIONS

RFS is a potentially fatal alteration in the fluid and electrolyte balance brought about by abrupt switch of body metabolism on initiation of feeding in patients with starvation. The defining metabolic abnormality is hypophosphatemia which may not be detected if the diagnosis was not made promptly. Although, a well described and treatable condition, the diagnosis can frequently be overlooked, owing to poor awareness among medical professionals regarding RFS. Though there are proper guidelines regarding identification of at risk population, definite diagnostic criteria and refined treatment guidelines are still lacking. Finally, RFS is a treatable but widely underdiagnosed and undertreated cause of nutritional morbidity and mortality.

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