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Om Parkash

Aga Khan University, om.parkash@aku.edu

Adil Ayub

Aga Khan University

Shahab Abid

Aga Khan University, shahab.abid@aku.edu

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Recommended Citation

Parkash, O., Ayub, A., Abid, S. (2014). Refeeding syndrome in a young girl with anorexia nervosa.. *JCPSP: Journal of the College of Physicians and Surgeons--Pakistan*, 24(supplement 2), s78-s80.

Available at: http://ecommons.aku.edu/pakistan_fhs_mc_med_med/203

Refeeding Syndrome in a Young Girl with Anorexia Nervosa

Om Parkash¹, Adil Ayub² and Shahab Abid¹

ABSTRACT

We report the case of a 20-year-old anorexic girl (BMI=12.9), who was misdiagnosed the first time and developed severe electrolyte imbalances due to lack of awareness about refeeding syndrome. Few cases of RS have been reported in literature and protocols have been suggested for prevention and management of this syndrome, including the awareness of circumstances in which it is most likely to develop, refeeding slowly and building-up micronutrient content over several days. Improved awareness and understanding of refeeding syndrome along with a well-coordinated plan are vital in delivering safe and effective nutritional rehabilitation. We suggest a slow and gradual increase in nutrition along with nutritional counselling and psychotherapy.

Key Words: *Refeeding syndrome. Anorexia nervosa. Nutritional rehabilitation.*

INTRODUCTION

Refeeding syndrome (RS) is a potentially lethal condition, defined as severe electrolyte and fluid imbalance that occurs due to aggressive nutritional rehabilitation in malnourished patients.¹ Patients at risk of developing RS are those with marasmus, protein energy malnutrition and massive weight loss (obese and anorexia nervosa patients).² The actual incidence of refeeding syndrome is unknown, but a study demonstrated a rate of 0.43% in hospitalized patients, with malnutrition being one of the strongest risk factors.³ The predominant features of refeeding syndrome include severe hypophosphatemia, hypokalemia and hypomagnesemia together with other fluid imbalance abnormalities which may lead to life-threatening cardiac, central nervous system, pulmonary and haematologic complications.⁴ Although refeeding malnourished patients may look straight forward, but the syndrome may emerge with oral, enteral and parenteral nutrition and can be fatal if not recognized and treated in a timely and proper manner.

We report the case of a 20-year-old lady, a known case of anorexia nervosa, who developed refeeding syndrome on aggressive nutrition and was managed at our hospital with total parenteral nutrition (TPN). This is in fact the first case of refeeding syndrome reported from Pakistan, where potential cases of refeeding syndrome can occur, due to large proportion of northern population living in relief camps with inadequate nutrition.

CASE REPORT

A 20-year-old girl from Karachi presented to the emergency care in March, 2010 with 2 days history of

severe abdominal pain, vomiting and generalized weakness. She had secondary amenorrhea and long-standing/chronic constipation since 3 years and was diagnosed to have anorexia nervosa a month ago. She had typical psychiatric history for anorexia nervosa and fear of being obese hence, avoiding food. She was encouraged to eat a large amount of meat a day before admission, after which she developed afore-mentioned symptoms. Over the previous 12 weeks she had lost 16 kg in weight. On examination, she weighed only 29 kg and was 150 cm tall (Body Mass Index (BMI) = 12.9). She was pale and emaciated with a pulse rate of 100 beats/minute and blood pressure of 90/50 mm/Hg. CVS and chest examination was remarkable and abdominal examination revealed sunken abdomen with mild tenderness in the right iliac fossa and no palpable viscera. Musculoskeletal examination showed generalized muscle wasting. Laboratory examination showed low albumin, hypokalemia, hypophosphatemia, hypochloremic metabolic acidosis and deranged liver function tests (Table I). Abdominal and chest X-rays were normal and abdominal ultrasound revealed a single gallstone. Upper and lower gastrointestinal endoscopy was also done to rule out malabsorption syndrome. Computed Tomography (CT) chest and abdomen were completely normal. Electrocardiography (ECG) showed a normal QT interval of 0.36 second.

Further past history revealed that she had consulted multiple gynaecologists in the last 2 years for her secondary amenorrhea, who prescribed her some medicines which regulated her cycles, but her prolactin levels were increased. She became pre-occupied with thoughts of being overweight (in spite of a weight of 42 kg and BMI of 18.6), stopped her medicines and started dieting and vigorous exercises. Her parents consulted a psychiatrist who diagnosed her with anorexia nervosa and prescribed anti-depressants. There was no family psychiatric history and no major childhood illness.

She was discharged after 4 days on esomeprazole and advised for nutritional counselling. She again presented

Department of Medicine¹ / Medical Student², The Aga Khan University Hospital, Karachi.

Correspondence: Dr. Om Parkash, F/A-12, Pak Tameer Plaza, Gulshan-e-Iqbal, Block 14, Karachi.

E-mail: om.parkash@aku.edu

Received: June 23, 2012; Accepted: April 06, 2013.

3 days later with severe phosphatemia, abdominal distension and feet swelling. She was diagnosed to have refeeding syndrome with severe electrolyte imbalance. Nutritional consult was taken and she was started on TPN 1 (for controlled gradual intake), which was later changed to TPN 2 as she did not tolerate oral diet. She was prescribed 1500 kcal/day diet and antiemetics were started before meals to stop initial vomiting. She was also engaged into psychotherapy and motivational therapy. There was gradual improvement in her condition and she was slowly switched to total oral intake. In 4 weeks, she gained 5 kg in weight and became quite stable. She was discharged on esomeprazole, antidepressants and vitamin supplements.

Presently, 2 years after discharge from the hospital, she is stable and taking proper meals regularly. She feels well and there have been complaints of occasional vomiting only.

DISCUSSION

Aggressive nutrient uptake especially carbohydrate may evoke insulin release and increase uptake of glucose, phosphate, magnesium etc. and the electrolyte imbalances can result in severe complications and sudden death. The natriuretic effect of insulin also causes sodium retention and oedema. Severe phosphatemia, the most dominant feature of refeeding syndrome can result in dyspnea, respiratory failure, hypotension, shock, arrhythmias and cardiac failure. Increased utilization of thiamine in these conditions may cause thiamine deficiency in some patients, which may result in Wernicke's encephalopathy.⁵ Other clinical signs and symptoms are shown in Table II.

A protocol for prevention and management of refeeding syndrome indicated the circumstances in which it is most likely to develop and stressed on importance of refeeding slowly and building up micronutrient content over several days with frequent monitoring.⁴ It emphasized that the treatment should never be executed with haste and the targeted weight gain should never exceed 1 kg/week. In adults, reports have recommended starting at 1000 kcal/day.⁶ The protein should not be restricted during nutritional support, but sodium and fluids should be restricted to prevent fluid overload (Na 20 mEq/d and fluids < 1000 ml/d).⁷ The guidelines for electrolyte and thiamine replacement are given in Table III.

Table I: Biochemical values.

	Admission values	Reference
Hb (g/dl)	11.3	13.7 - 16.3
Platelets (x 10 ⁹ /l)	148	150 - 400
Albumin (g/dl)	2.3	3.5 - 4.8
Phosphate (mmol/l)	1.6	2.2 - 4.8
Potassium (mmol/l)	2.6	3.6 - 5
Magnesium (mmol/l)	1.8	1.9 - 2.5
Calcium (mmol/l)	6.9	8 - 11
Chloride (mmol/l)	74	104 - 114
Sodium (mmol/l)	120	136 - 138
BUN (mg/dl)	12	6 - 16
Creatinine (mg/dl)	0.6	0.85 - 1.35
Bicarbonate (mEq/l)	33.5	17.5 - 27.5
Total bilirubin (mg/dl)	5.3	0.25 - 1
SGPT (IU/L)	148	3 - 33
SGOT (IU/L)	174	18 - 32
Alkaline phosphatase (IU/L)	86	28 - 124

Table II: Clinical signs and symptoms of refeeding syndrome.¹

Hypophosphatemia	Hypokalemia	Hypomagnesia	Thiamine deficiency	Na retention	Hyperglycemia
Dyspnea	Arrhythmias	Arrhythmias	Encephalopathy	Oedema	Hypotension
Hypotension, thrombocytopenia	Paralysis, muscle necrosis	Tremors diarrhea	Lactic acidosis	Fluid overload	Respiratory failure
Respiratory failure	Constipation	Seizures	-	-	Ketoacidosis
Shock	Rhabdomyolysis	Coma	-	-	Dehydration
Arrhythmias	-	Diarrhea	-	-	-
Cardiac failure	-	-	-	-	-

Table III: Guidelines for replacement therapy.¹

Phosphate	Intravenous replacement dose (administer over 6-12 hours) Children: 0.08-0.24 mmol/kg Maximum daily dose: 1.5 mmol/kg Adults: Initially 0.08 mmol/kg for mild and 0.16 mmol/kg for severe hypophosphatemia Maximum dose: 0.24 mmol/kg per dose
Magnesium	Intravenous replacement dose (administer over 4 hours) Children: 25 - 50 mg/kg per dose (0.2-0.4 mEq/kg per dose) Maximum single dose: 2000 mg (16 mEq) Adults: 1 g every 6 hours for 4 doses for moderate and 8 - 12 g/d in divided doses for severe
Potassium	Intravenous replacement dose (administer over atleast 1 hr) Children: 0.3 - 0.5 mEq/kg per dose Max Dose: 30 mEq per dose Adults: same
Thiamine	Children: 10 - 25 mg/d administered PO everyday for 2 weeks and then 5-10 mg/d for 1 month. Adults: 5 - 30 mg per dose 3 times per day, administered IV and then 5-30 mg/d administered PO for one month

Although, nutritional rehabilitation is an essential component of the physical treatment of anorexia nervosa and other malnourished states, but psychological treatment is also necessary to address the anxiety issues of the patient. A good therapeutic alliance between the doctor, patient and the family establishes a cooperation that enables to work on motivational factors. The treatment at home is discussed in some studies to have more benefits.¹ These include encouraging the patient's sense of responsibility and control over the treatment, eliminating the psychiatric trauma of hospitalization and increased chances of rehabilitation in patient's own natural environment. Still, due to the chances of infection, bleeding, air emboli and addiction to TPN, the practicality of home treatment is being questioned.⁸ So, improved awareness and understanding of refeeding syndrome along with a well-coordinated plan are vital in delivering safe and effective nutritional rehabilitation.

In summary, rehabilitation of anorexia nervosa or other malnourished states can result in fatal electrolyte disturbances (refeeding syndrome) and, therefore, proper and timely nutrition is recommended. We suggest a slow and gradual increase in nutrition along with nutritional counselling and psychotherapy, including the

patient's family, to prevent resistance from the patient and to ensure long-term compliance by the patient.

REFERENCES

1. Fuentebella J, Kerner JA. Refeeding syndrome. *Pediatr Clin North Am* 2009; **56**:1201-10.
2. Khan LU, Ahmed J, Khan S, Macfie J. Refeeding syndrome: a literature review. *Gastroenterol Res Pract* 2011. Epub 2010 Aug 25.
3. Mehanna H, Nankivell PC, Moledina J, Travis J. Refeeding syndrome--awareness, prevention and management. *Head Neck Oncol* 2009; **1**:4.
4. Stanga Z, Brunner A, Leuenberger M, Grimble RF, Shenkin A, Allison SP, *et al.* Nutrition in clinical practice-the refeeding syndrome: illustrative cases and guidelines for prevention and treatment. *Eur J Clin Nutr* 2008; **62**:687-94. Epub 2007 Aug 15.
5. Reuler JB, Girard DE, Cooney TG. Current concepts. Wernicke's encephalopathy. *N Engl J Med* 1985; **312**:1035-9.
6. Miller SJ. Death resulting from over zealous total parenteral nutrition: the refeeding syndrome revisited. *Nutr Clin Pract* 2008; **23**:166-71.
7. Palesty JA, Dudrick SJ. The goldilocks paradigm of starvation and refeeding. *Nutr Clin Pract* 2006; **21**:147-54.
8. Latzer Y, Eysen-Eylat D, Tabenkin H. A case report: treatment of severe anorexia nervosa with home total parenteral hyperalimentation. *Int J Eat Disord* 2000; **27**:115-8.

