

Nutritional Therapy Leads To Complete Recovery of Left Ventricular Dysfunction in Anorexia Nervosa: A Case Report

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Highlights

This case highlights the cardiac complications associated with anorexia nervosa and how early recognition and treatment significantly affects overall prognosis. A few cases have been reported in literature where cardiomyopathy associated with anorexia nervosa was reported but this is the first case where adequate medical management and metabolic support lead to complete recovery.

Keywords: Anorexia nervosa, cardiomyopathy, refeeding syndrome

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A young female presented to our hospital with lethargy and dehydration with EKG changes notable for T wave inversions in precordial and inferior leads. Echocardiogram showed severely reduced left ventricular (LV) function. Patient was diagnosed with anorexia nervosa and started on high calorie diet as per metabolic recommendations, ace inhibitor, beta-blockers and statin. 10 month follow up showed a significant improvement in heart function showing the reversible nature of anorexia nervosa induced cardiac dysfunction

Cardiac abnormalities, specifically cardiomyopathy are known in patients with Anorexia nervosa and have been attributed to the deficiency of multitude of minerals, vitamins and electrolytes. It is important to recognize that patients with anorexia can develop cardiac dysfunction and early nutrition along with medical optimization can lead to complete reversal of cardiac dysfunction. Multi-disciplinary team approach involving cardiologist, metabolic support, internist, and psychiatrist is required for appropriate care of these patients.

Introduction

Anorexia nervosa (AN) is a disorder characterized by low body weight, decreased caloric intake, distorted body perception and various metabolic and hormonal abnormalities that result from poor nutritional status. An estimated 0.5-3.7% females will have anorexia nervosa in their lifetime and up to 1% adolescent

female have AN. Cardiac complications are commonly observed in patients with this disorder and up to ten percent patients may die of sudden cardiac death. Myocardial damage is thought to be reversible improving after caloric replacement

Case Presentation

A 20 year old Caucasian female with a history of Anorexia Nervosa presented to the hospital with dehydration and failure to thrive. She denied any previous cardiac history, or history of cardiac disease in family. She denied any history of flu like symptoms, recent travel or diarrhea. On examination patient was noted to be lethargic, dehydrated, emaciated with a weight of 37.8 kilogram, height of 1.67 meters and BMI of 13.5 kg/m². Her weight was noted to be 60% of ideal weight for her height. Vitals on admission were stable with a Heart rate- 76, Respiratory rate -16, Blood pressure-103/76 and saturating 97% on room air. No signs or symptoms of heart failure noted on examination. Routine lab work showed a Hemoglobin -15.5, sodium -128, Potassium-3.8, BUN/creatinine of 21/0.6. Liver function tests revealed – AST-50, ALT-81, Bilirubin(T)-1.7,(D)-0.9, Total protein-5.8, Albumin-3.6, Prealbumin-16.1. Thyroid function tests showed- TSH- 0.65, free T3- 1.84, free T4-0.80. She had normal levels of vitamin B1, B2, B6, and Selenium. EKG (Figureure-1) done showed diffuse T wave inversions in precordial leads (V1-V6) and inferior leads (II, III, aVF).

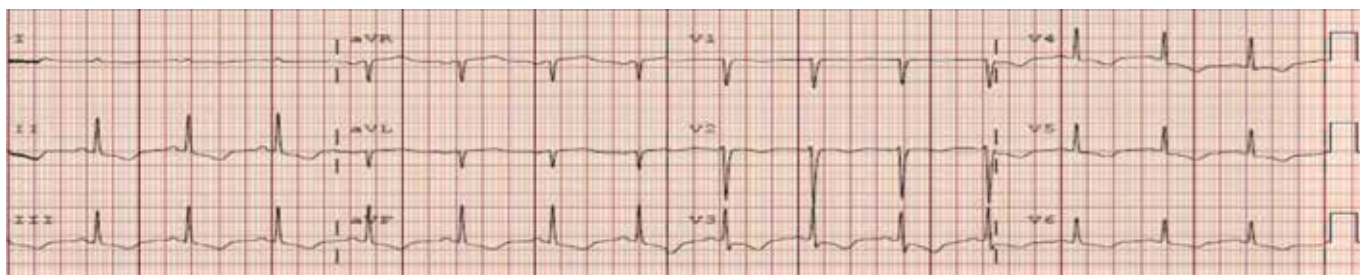


Figure 1: EKG showing a heart rate of around 80-90bpm, sinus rhythm and T wave inversions from V1-V6, II, III and aVF

An echocardiogram(Figure-2a)done during admission showed: moderately to severely reduced left ventricular systolic function with an EF of 30%, normal Left Ventricular(LV) diastolic filling pressures, mildly reduced Right Ventricular(RV) systolic function and a small pericardial effusion.

The differential diagnosis at this point included – takotsubo cardiomyopathy, viral myocarditis, coronary artery disease and anorexia nervosa/nutritional Cardiomyopathy. Patient underwent cardiac catheterization because of concerning findings on EKG and echocardiography. Cardiac catheterization showed no evidence of any coronary artery disease Patient was transferred to intensive care unit after a new onset witnessed generalized seizure with initiation of gradual nutritional support. She was diagnosed with re-feeding syndrome with severe electrolyte disturbances (hypokalemia, hypophosphatemia and hypomagnesaemia) which were replaced aggressively. Patient was seen by psychiatrist during the hospital stay who attributed the development of anorexia nervosa due to stressors in life, low self-esteem, inappropriate guilt, pervasive sadness and a diagnosis of clinical depression was made.

Patient had loss of weight starting almost 1 year prior to admission and never felt like eating. Psychiatrist initially recommended starting fluoxetine for clinical depression but it was held given its interaction with carvedilol. Patient was started on clonazepam for sleep. She was also seen by metabolic support who recommended – to start on peripheral vein nutrition providing 30g Amino acid, 50g Glucose and 20g fat in 1200 ml/day with extra potassium, Magnesium, Phosphorus, and thiamine. She was also started on Nasogastric feeds and supplementation of electrolytes, thiamine and folic acid. The patient's status improved gradually during the hospital course with nutritional support.

On discharge she was placed on a high calorie diet as per metabolic support recommendations and a multivitamin supplement along with standard medical therapy for heart failure including beta-blocker, ace-inhibitor and a statin. Upon follow up 10 months later, she had gained around 29 kilograms with her BMI increasing from 13.5 to 21.6 kg/m². A follow-up echocardiogram (Figure-2b) at this time showed a normal left ventricular systolic function with an ejection fraction of 65%.

Discussion

Anorexia nervosa is a common disorder affecting mostly adolescent females with a mean age of 15 years. It is characterized by a decrease caloric intake, fear of weight gain, distorted body image perception, amenorrhea and behavioral changes. Patients with AN suffer from bone marrow suppression, liver failure and numerous metabolic complications as a result of severe malnutrition.¹ Cardiac complications are fairly common occurring in up to 80% patients ranging from rhythm disturbances, low voltage EKG, QT prolongation, ST-T segment changes, U waves, hypotension, decreased



Figure 2A: Parasternal short axis view at the level of papillary muscles showing septal and inferior wall hypokinesia and small pericardial effusion



Figure 2b: Parasternal short axis view at the level of papillary muscles shows improved LV contractility and normal wall motion

cardiac output, cardiomyopathy and mitral valve prolapse.^{2,3} Myocardial damage is thought to be reversible with reasonably good prognosis upon regaining weight.⁴ Various postulated mechanisms include reduced LV mass, hypoglycemia and stress induced catecholamine excess like cardiomyopathy. The risk of congestive heart failure, arrhythmia and sudden cardiac death is greatest during re-feeding phase⁵ at which time the patient needs to be closely monitored.

Conclusion

This patient presented with severely reduced LV function as a result of multiple nutritional deficiencies and developed electrolyte disturbances characteristic of refeeding syndrome that were managed aggressively in the critical care unit. With adequate nutrition and support she showed a remarkable recovery with normalization of LV function. It is important to recognize the features of Anorexia nervosa related cardiomyopathy given that with timely intervention there is favorable outcomes and complete recovery of LV function. Multi-disciplinary team including cardiologist, nutritionist, social support and psychiatrist is required for the management of anorexia nervosa and its cardiac complications

Declarations of Interest

The authors declare that there is no conflict of interests

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