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# Altered Mental Status and Anorexia Nervosa in the Setting of Cultural Diversity

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## Abstract

13-year-old female with extreme weight loss and restrictive eating leading to severe malnutrition was admitted to a pediatric hospital for bradycardia. Her hospital work-up was remarkable for down trending phosphorus, extremely low platelets, extremely elevated liver function tests, pericardial effusion, slowing on EEG, and abnormal MRI brain and CT head. Her hospital course was complicated by altered mental status, resulting in loss of English language ability, and persistent tachycardia resulting in transfer to the Pediatric Intensive Care Unit (PICU). Treatment included nutritional rehabilitation, thiamine supplementation, occupational therapy, physical therapy, care coordination with an in-person interpreter, Buddhist Master and cultural navigator. The severity of some of her symptoms are uncommon in anorexia nervosa and rarely reported in medical literature, which made management challenging. We hope sharing this case will provide valuable insights for clinical treatment of patients with severe anorexia nervosa by optimizing both nutritional and culturally informed care to immigrant patients.

## Introduction

Reports of altered mental status with severe lab abnormalities in patients with anorexia nervosa are rare and research on eating disorders in immigrant populations is limited. Some studies suggest that immigrants may have higher rates of eating disorders in the first several years following immigration [1]. Our patient reported that her body looked "fat" when reviewing a selfie, specifically focusing on the "fat" around her stomach. Her mother also noted she wanted to become like a model, and felt more valued when several family members visiting from Vietnam commented on how thin she was. Eating disordered cognitions are known to be influenced by cultural differences in self-construal, with Asian American females often coming from cultures with higher sense of interdependence, forcing them to reconcile these values with the highly independent self-construal common in Western cultures [2]. Risk for eating disorders among Asian Americans is further observed to be significantly influenced by parental perception of the dominant cultures idea of beauty [3]. Literature on altered mental status in anorexia nervosa consists of case reports of patients with Wernicke Encephalopathy. This patient exhibited many of the severe physical and laboratory findings consistent with starvation however; cultural diversity and psychopathology confounded the management of this patient. Such cases have not been reported in the literature.

## Description of Case Report

A 13-year-old Vietnamese immigrant female with restrictive eating and extreme weight loss was brought to the Emergency Department by her mother for evaluation of dizziness and heart palpitations at school. The patient acknowledged a 40 pound weight loss over 15 months from intentional dietary restriction and compulsive exercise driven by fears of "getting fat," however her parents attributed the weight loss to constipation and abdominal discomfort. She had no prior medical or psychiatric diagnoses. Family history was significant for an aunt who reportedly had auditory hallucinations.

Her family had immigrated to the United States from Vietnam two years prior and while the patient spoke Vietnamese and English fluently, her parents were almost exclusively Vietnamese speaking. The family identified as Buddhist.

She presented cachectic (60% of Ideal Body Weight (IBW); BMI z-score= -5.97), with bradycardia, normal neurologic exam and abnormal labs [Table 1]. She was admitted to a general medical floor in a pediatric hospital and was cared for by a general medicine team, placed on the Anorexia Nervosa (AN) Refeeding Protocol with consultation by Child Psychiatry, Adolescent Medicine and Clinical Nutrition. Her hospital course was complicated by development of a petechial rash and pressure ulcer on the sacrum/coccyx, vesicular rash, generalized abdominal pain, altered mental status 10 days after admission, including non-purposeful movements, communication deficits and inability to speak English, vestibular dysfunction with blowing sensation in ear, and visual hallucinations. She required brief care in the Pediatric ICU for worsening encephalopathy (disorientation, unresponsive episodes, and intermittent purposeless hand movements), persistent tachycardia, murmur and intermittent fever. Her abdominal pain and elevated hepatic labs included an abdominal x-ray concerning for Superior Mesenteric Artery syndrome, but an upper gastrointestinal study was normal. Hematologic abnormalities were evaluated by the Hematology-Oncology service. Evaluation of fever and skin findings included blood and urine cultures to complete an infectious work-up, consultation by Infectious Diseases and wound care nurse. Evaluation of the tachycardia and 1/6 systolic left upper sternal border murmur included electrocardiogram (non-specific ST-T wave changes) and echocardiogram (small to moderate

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**Table 1:** Hospital Day of Presentation of Abnormalities

| Hospital Day | Abnormal Lab | Abnormal Imaging | Abnormal Exam |
|---|---|---|---|
| Admission | WBC (12.8k/mm^3)<br>Platelets (108k/mm^3)<br>ANC (8,704/ mm^3) | | |
| | | | |
| 4 | Platelets (78 k/mm^3),<br>Phosphorus (3.0 mg/dl) | | Petechial Rash |
| | | | |
| 5, 6, 7 | ALT (916IU/L)<br>GGT (100IU/L)<br>Lipase (1357IU/L)<br>Platelets (48 k/mm^3) | Abdominal X-ray: Extensive distention of the stomach with air-fluid level. Findings would be consistent with SMA syndrome | Abdominal Pain |
| | WBC (4.3 k/mm^3) | Upper GI: Delayed emptying is perhaps related to the patient's very thin habitus and difficulty of contrast passage as the duodenum traverses anteriorly across the spine, rather than primarily related to the vasculature angle. | |
| | | | |
| 9 | | Echocardiogram: small to moderate pericardial effusion. | Tachycardia (up to 160s bpm) |
| | | | |
| 10 | Anion Gap Acidosis | CT head: Diffuse parenchymal volume loss with mild ex vacuo enlargement of the lateral and third ventricles. | Altered mental status (hallucinations, changed in voice, withdrawing from communication, less responsive to questions). Glasgow Coma Score (GCS) 9. |
| | | | |
| 11 | Urine Culture (positive MDR E.coli).<br>Toxicology Screen (positive caffeine and lidocaine). | | Fever (38.1 degrees Celsius) |
| | | | |
| 13, 14 | LDH (1128 IU/L) | EEG: generalized slowing in posterior regions (most prominent in R hemisphere) but no epileptiform discharges. | Mental Status waxed and waned.<br>Vesicular Rash |
| | | MRI: Abnormal diffusion restriction and T2 FLAIR hyperintensity symmetrically involving anterior aspect of the insular cortices and splenium of corpus callosum. Transient lesions in the splenium of the corpus callosum have a number of non traumatic etiologies including seizures, demyelination. | |

pericardial effusion). Altered mental status was evaluated by laboratory studies, EEG, CT head, MRI brain and ongoing consultation with Neurology and Psychiatry. A urine toxicology screen was positive for caffeine and lidocaine (despite child and parent denying intake of caffeine, diet pills, and herbal supplements).

Her petechial rash was attributed to down trending platelets, all lab abnormalities were attributed to severe malnutrition and fever was initially attributed to pyelonephritis. Further investigation by Infectious Disease consultants revealed questionable adequacy of urine samples and negative urinalysis. Radiology consultants felt the lesions (transient lesions in the splenium of the corpus callosum) found on MRI could be from prior seizures, demyelination, hypoglycemia, infectious and metabolic toxicities (sympathomimetic diet pills). Neurology team's differential diagnosis for her symptoms included protein-calorie malnutrition and encephalopathy, acute metabolic derangement with hepatic encephalopathy, Wernicke Encephalopathy (WE) or ICU delirium. We concluded the most likely etiology was a severe nutritional deficiency secondary to anorexia, which included thiamine deficiency and susceptibility to WE.

Due to the patient's communication deficits, we relied heavily on the family for assessments. Interpreter services assisted to bridge the language barriers. Use of cultural navigator and a Buddhist Master assisted to facilitate understanding of the family's perspectives on the patient's illness. This revealed that mother believed the patient was struggling with a spiritual conflict resulting from the mother's abortion when the patient was 2 year old, and that the aborted fetus was spiritually occupying the patient and hindering her medical recovery by preventing food from providing nourishment. The patient's mother shared that the patient's blood and the spirit's blood mixed during a blood draw and that Buddha was attempting to rid the spirit from the patient's body. The Buddhist Master assisted, with the help of a cultural navigator, to facilitate understanding amongst medical providers of the family's beliefs. This enabled a common understanding that sharing the spirits were not bad and needed acknowledgement, but and would not be impacting medical decisions around patient care.

Refeeding was started at 800kcal/day due to high risk for refeeding syndrome given extremely low body weight, with slow advancement to goal calories of 2400 kcal/day. Due to the frequent NPO status for procedures, she briefly received nasogastric feeds. She received thiamine supplementation, started at 250mg and completed 200 mg/day by mouth for 55 days [4]. This was initiated without drawing baseline level to avoid delay, as WE is a clinical diagnosis and studies have reported normal thiamine levels in patients who have met diagnosis [5]. The medical treatment was in alignment with her spiritual treatments per their Buddhist Master. Antipsychotic pharmacotherapy was deferred due to potential for side effects while implementing environmental approaches to manage delirium.

Two days after initiation of thiamine, she began reorienting to her surroundings and had briefer periods of altered mental status. Around day 29 she had significant improvement expressing English, occurring in the setting of only having gained approximately 1.5kg since her admission. Her hematologic and hepatic lab abnormalities trended toward normal with nutritional rehabilitation. She began eating high calorie foods by mouth and denied anxiety with refeeding or urges to lose weight. Due to her compliance with refeeding and in an effort to align with parental preferences, an exception to hospital protocol was made to allow the patient to eat culturally specific food provided by her family. Despite daily conversations and care conferences, the family indicated that they did not fully understand the patient's illness, citing medical complications of "stomach problems" as the source of weight loss while minimizing psychiatric concerns. After 43 days in the hospital, she was discharge at 72.7% of IBW (BMI z-score -2.92) with close follow-up in Adolescent Medicine, Clinical Nutrition and Mental Health Therapy. Outpatient planning for specialized mental health treatments for anorexia was challenging due to language and cultural barriers therefore the family was referred to a counseling center with cultural expertise but lacking eating disorder specialists. Since discharge, the patient engaged in outpatient management with very limited success, exacerbated by parental accommodation to her preferences over the treatment team's. She has exhibited repeated episodes of abrupt weight loss requiring multiple hospitalizations, including a specialized inpatient eating disorder program for intensive weight restoration.

## Discussion & Conclusion

Guidelines on the use of cultural navigators and religious leaders to facilitate communication and cultural understanding with families are quite limited and our case highlights the importance of their use [6]. There is limited literature on factors placing Asian Americans at increased risk for eating disorders, despite escalating awareness of the impact of cultural notions of beauty and appearance [3].

Our patient's extreme low body weight placed her at high risk for nutritional deficiencies, refeeding syndrome [7] and severely abnormal laboratory studies. Reports of such severe medical consequences of anorexia nervosa are limited in current literature. We conducted a literature review for guidance in assessment and management of patients with anorexia nervosa and severely low platelets, elevated liver function tests and altered mental status. Studies have reported decreased bone marrow production to be a factor and have provided incidence rates for hematologic abnormalities in anorexia nervosa [8, 9]. A retrospective cohort study of patients with anorexia nervosa and refeeding syndrome determined elevated hepatic tests were due to non-alcoholic steatosis, hepatic hypoxia and glycogenic depletion [10]. We suspect her restriction may have included restriction in thiamine rich foods such as pork, legumes, rice and cereal and she denied taking a multivitamin prior to admission, placing her at risk for thiamine deficiency [11]. We did not obtain a thiamine level for lack of specificity, as a normal thiamine blood level does not exclude the possibility of Wernicke Encephalopathy [5] and given the severity of her deteriorating status, we did not feel it necessary to delay intervention. We reviewed current literature on the modified diagnostic criterion for WE as well as international and adult guidelines for guidance in management of a patient with AN and altered mental status; which included careful nutritional rehabilitation and thiamine supplementation and resulted in improved lab abnormalities and mental status [12, 13, 14]. While thiamine supplementation is described in the literature, there are no standard guidelines for supplementation in adolescents with severe malnutrition due to anorexia nervosa. Recommendations determined by body weight or clinical symptoms are needed and could be useful for managing patients with altered mental status in the setting of dietary deficiencies, such as prompt use of thiamine repletion in patients with severe low body weight, to avoid further clinical deterioration. Furthermore, given the life threatening nature of thiamine deficiency, more research in this area is warranted to assist with treatment recommendations and nutritional restoration.

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