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Case Report

Dietary Management of a Patient with Very-Early-Onset Inflammatory Bowel Disease (VEO-IBD): A Case Report

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ABSTRACT

We presented an 18-month old female patient known as failure-to-thrive (FTT) with poor weight gain during the first postpartum weeks. After 20 days of birth, she manifested lethargy, fatigue, fever, and diarrhea and was admitted to the hospital with acute colitis and rectovaginal fistula. She was later fixed for the fistula and underwent upper gastrointestinal (GI) endoscopy, abdominopelvic sonography and colonoscopy and was eventually diagnosed with very-early-onset inflammatory bowel disease (VEO-IBD).

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Introduction

Inflammatory bowel disease (IBD) has two groups of chronic relapsing inflammatory intestinal disorders including Crohn's disease (CD) and ulcerative colitis (UC) that has an increasing trend worldwide (1). The prevalence of IBD has increased in Asian and Eastern countries in the last decades because of significant changes in lifestyle, particularly in dietary habits (2). There is not enough data regarding the energy requirements of children with IBD (3). The disease can appear as a very-early-onset inflammatory bowel disease (VEO-IBD) that was shown to have rising trend prevalence (4-8). Multiple genetic and environmental factors were reported in the pathogenesis of VEO-IBD (6, 9-11). Malnutrition that is assessed by weight-for-age and length/height-for-age, is common in VEO-IBD patients, but it is unclear how catch-up growth could be achieved for a patient with multiple food intolerances. Some researches have suggested enteral nutrition to support growth in these children (12-14); however, the effectiveness and practicality of such methods are not clear, specifically in the long term. Therefore, there is a need to solve the lack of practical guidelines on how to approach these cases clinically. In this case-report study, we first tried to present the nutritional dilemmas regarding the patient and secondly proposed some possible methods on how to manage the inflictions related to the condition and eventually lead her into a healthy adulthood.

Case Report

An 18-month old female patient known case of failure-to-thrive (FTT) has been investigated. According to the history presented by her parents, she was weak at the time of birth and during the first postpartum weeks, she had a poor weight gain. She was born term and weighed 3100 grams at the time of birth. The patient was breastfed until 20 days of birth and later she manifested lethargy, fatigue, fever, and diarrhea. Afterwards, the patient was admitted to the hospital and was diagnosed with acute colitis and rectovaginal fistula. Their parents claimed that she had suffered from chronic diarrhea which was later diagnosed as an allergy to cow's milk protein. Then, she had undergone a surgery to fix the fistula. Her parents did not report any specific medical history. At the time of the visit, the patient was well and did not present any irregular manifestations. But in the following visits, there were some skin rashes on her face and extremities. The patient was conscious, but a little irritable. The results of her upper gastrointestinal (GI) endoscopy, abdominopelvic sonography and colonoscopy did not reveal any abnormalities. She was eventually diagnosed with very-early-onset inflammatory bowel disease (VEO-IBD) and then was referred to a specialized clinic for further interventions. The list of the patient's post-admission medication is presented in Table 1.

Table 1: In-hospital medication of the patient.

Medication	Dosage
Metronidazole	60 mg/Q8h
Vancomycin	60 mg/Q6h
Prednisolone	7.5 mg/QD
Clotrimazole ointment	Q8h
Imipenem	152mg IV/Q8h
Pantazole	6mg/QD
Acetaminophen	60 mg/IV/PRN

Q6h: Wvery 6 hours, Q8h: Every 8 hours, QD: Every day, IV: Intravenous, PRN: Pro re nata.

Anthropometric measurements and physical examination: The patient had a weight of 6 kg and a height of 75 cm, yielding a body mass index (BMI) of 10.71 kgm^{-2}. Regarding the indices of weight-for-age and height-for-age according to the Centers for Disease Control and Prevention (CDC) growth charts, the patient was below the accepted percentile (5^{th}). When looking at her growth chart from the birth, her weight had started to plateau from the age of 2 months; and she had rather normal growth from birth up to this age. Her mother claimed that her linear growth had also begun to plateau.

In dietary assessment, the patient still had oral intake. She was breastfed till the age of 20 days, when she was diagnosed with allergy. The mother's milk was discontinued and further different formulas were tested to choose the one causing the least adverse reactions and supporting the most growth (considering both weight and stature). The formulas that were fed to the patient were as follows, chronologically: EleCare®, NeoCate®, Aptamil®First Infant Milk, and finally Biomil® Soy. Among these, the patient was only able to tolerate the Biomil® Soy formula and the others were discontinued. In addition to the formula, the patient consumed limited number of table foods to which she was rather tolerant; including cooked rice, egg yolk, and olive oil. Based on our analysis, she consumed approximately 700 kcal per day which was way below her estimated energy requirements.

Laboratory Assessment: The patient's laboratory data (followed-up during a 2-day period) is summarized in Table 2. The most remarkable anomalies included reduced levels of blood sugar, blood urea nitrogen (BUN), serum creatinine (Cr), serum sodium, red blood cells (RBCs) count, hemoglobin (Hb), hematocrit (Hct), mean corpuscular volume (MCV), mean hemoglobin concentration (MCH), mean cell hemoglobin concentration (MCHC), and partial thromboplastin time (PTT); and increased levels of white blood cells (WBC) and platelet count, red cell distribution width (RDW), and International Normalized Ratio (INR).

Medical Nutrition Therapy

Calorie Requirement: There is not enough data indicating that energy requirements of children with IBD (1). However, it seems that when using the following formula: [(89×weight of child [kg]-100)+20 (kcal for energy deposition)] (4), the energy requirement is overtly underestimated; most probably because it uses the current weight of the patient who is currently underweight and stunt, despite consuming more than her calculated needs (4). Taking these factors into consideration, we propose that the energy intake of the patient could be estimated to be around 1000 kcal to suffice her surplus energy needs to support her catch-up growth (2).

Macronutrients: It has been proposed that patients with pediatric IBD during active disease, poor nutritional intake, and growth retardation receive at least 25% of their energy intake from protein until linear growth has improved (1). According to the same guideline, the intake of carbohydrate and fat for this patient fells into the range of 40%-60% and 35%-40% of estimated energy requirement (EER); respectively. As we have already dedicated 25% of her calorie requirement to protein, it would leave us with 40% and 35% of EER for carbohydrate and fat,

Table 2: The laboratory data of the patient recorded during 2 days follow-up.

Variable	Day 1	Day 2	Normal Range
WBC ($\times 10^3/\mu L$)	27.8	25.2	4-10
RBC ($\times 10^6/mm^3$)	4.12	3.99	4.2-5.2
Hb (g/dL)	9.2	9	12-16
Hct (%)	30.2	30	36-56
MCV (fL)	73.3	75.2	80-96
MCH (pg)	22.3	22.6	26-34
MCHC (g/dL)	30.5	30	32-36
Platelet ($\times 10^9/mm^3$)	756	968	150-450
RDW (%)	15.7	16.4	11-16
BS (mg/dL)	63	-	45-156
BUN (mg/dL)	6	7	8-20
Creatinine (mg/dL)	0.22	0.31	0.6-1.2
Serum Na (mEq/L)	131	-	136-145
Serum K (mEq/L)	4.7	-	3.5-5.5
AST/SGOT (U/L)	33	-	<40
ALP (U/L)	275	-	180-1200
T. bilirubin (mg/dL)	0.3	-	0.1-1.2
D. bilirubin (mg/dL)	0.1	-	<0.3
Phosphorus (mg/dL)	5.1	-	3.5-5.5
Albumin (g/dL)	2.4	3	3.5-5.2
PTT (seconds)	24.6	-	25-35
INR	1.49	-	0.9-1

WBC: White blood cells, RBC: Red blood cells, Hb: Hemoglobin, Hct: Hematocrit, MCV: Mean corpuscular volume, MCH: Mean hemoglobin concentration, MCHC: Mean cell hemoglobin concentration, RDW: Red cell distribution width, BS: Blood sugar, BUN: Blood urea nitrogen, Na: Sodium, K: Potassium, AST: Aspartate amino transferase, SGOT: Serum glutamate-oxaloacetate transferase, ALP: Alkaline phosphatase, T. bilirubin: Total bilirubin, D. bilirubin: Direct bilirubin, PTT: Partial thromboplastin time, INR: International Normalized Ratio.

respectively. The amount of formula per day must be calculated based on the required protein; if carbohydrate and fat requirements are not met, and we suggest that the remaining can be compensated with rice and MCT to which she is currently tolerant.

Considering the micronutrients, the anomalies in the patient's laboratory data indicated an obvious iron deficiency anemia (IDA). To ameliorate her IDA, she took iron supplement. According to her parents, she manifested adverse reactions to all supplements, except to FeraMax® which she must continue to take until her blood indices are normalized. Even though, the evidence is still insufficient to support any need for global micronutrient supplementation (1), it seems that in this specific case, a multivitamin/multimineral supplement is advisable. The rationale behind this decision is that the patient is clearly underweight and her linear growth is lagging; this may be due to her inability to meet her macro-/micronutrient requirements through a regular diet, because of her intolerance to multiple foodstuffs.

Discussion

The prevalence of VEO-IBD is on the rise (3-6). Several genetic and environmental factors may play a role in the pathogenesis of VEO-IBD (4, 7-9); discussing these factors are well beyond the scope of this article. Although seemingly, there has been some effort to solve the lack of practical guidelines on how to approach these cases clinically, there are still some dark zones.

For instance, as discussed earlier, the evidence postulates that the energy needs of these patients are the same as healthy children; however, as it was evident in this case, if we follow the current guidelines, the patient would be underfed. Malnutrition, assessed by weight-for-age and length/height-for-age, is common in VEO-IBD patients, but it is unclear how catch-up growth could be achieved for a patient with multiple food intolerances. Some researches even suggest enteral nutrition to support growth in these children (10-12); however, the effectiveness and practicality of such a method is not clear, specifically in the long term. Evidently, this area warrants further research, especially in the form clinical trials, to clear out the controversies regarding malnutrition in VEO-IBD patients.

Conflict of Interest

None declared.

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