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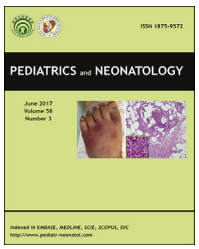

BRIEF COMMUNICATION

Congenital Microvillus Inclusion Disease in the Differential Diagnosis of Intractable Metabolic Acidosis

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1. Introduction

Microvillus inclusion disease (MVID), a familial enteropathy that presents with severe refractory diarrhea, was first defined in 1978.[1] It is an autosomal recessive disease. This report presents the case of a 3-day-old girl with secretory diarrhea, which was originally thought to be urine, caused by MVID. She presented with severe weight loss, hypernatremic dehydration, and metabolic acidosis.

2. Case Report

A 3-day-old girl was transferred to our hospital (Faculty of Medicine, Hospital in Kirikkale) with abdominal distention, metabolic acidosis, and severe hypernatremic dehydration. The patient was born by cesarean section at 36 gestational weeks after an uncomplicated pregnancy. Her Apgar scores were 8 and 10, and her birth weight was 3145 g. The parents were consanguineous. The mother had a history of three unexplained spontaneous abortions, and she gave birth to an infant who died at 25 days of age. That infant was also hospitalized because of hypernatremic dehydration and metabolic acidosis; however, the cause of death was not known. Family members including both parents, grandparents, and also the other relatives had no metabolic or genetic disorders. The patient presented here developed severe dehydration and metabolic acidosis at 3 days old in a local hospital and was transferred to our neonatal intensive care unit.

On examination, the patient had severe dehydration, and her abdomen was distended and nontender. The other physical findings were normal. The laboratory findings revealed severe metabolic acidosis with hypernatremia: serum sodium 159 mEq/L, urea 42 mg/dL, creatinine 1 mg/dL, blood pH 7.24, HCO_3 9.3 mEq/L, PCO_2 19, base excess 17, and anion gap 19 mEq/L. The infant was resuscitated with normal saline, and appropriate intravenous fluid, and HCO_3 were started. Empiric antibiotic treatment was also started after taking blood for culture.

On Day 6, the sodium level had fallen, and the metabolic acidosis had been corrected. She was feeding orally, and the HCO_3 and intravenous fluid was stopped. However, the patient's condition worsened, and intractable metabolic acidosis reappeared on Day 8. A septic work-up revealed no evidence of infection. An X-ray revealed large intestinal loops.

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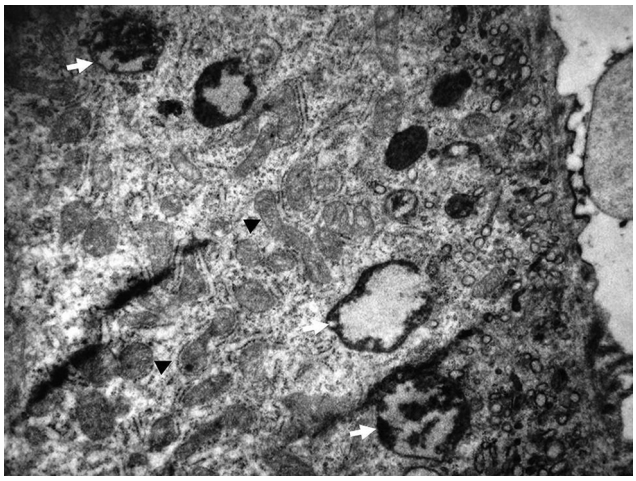

Figure 1 Electron micrograph of duodenal mucosa shows microvillus atrophy, intracytoplasmic microvillous inclusion ×20 000.

The patient's metabolic screen for inborn errors of metabolism, cranial, and abdominal ultrasonography, and echocardiographic evaluation were normal.

On Day 13, the intestinal distension had increased, and metabolic acidosis continued, although with a sodium bicarbonate deficit. The urine pH was 6. Other reasons for metabolic acidosis were considered. It was suspected that what we thought was urine was actually watery diarrhea. To confirm this, we inserted a nasogastric tube in the rectum and immediately returned large amounts of watery stool. Therefore, the diagnosis focused on intractable diarrhea. The stool culture was negative, and the stool osmolar gap was 40 mOsm/kg, indicating secretory diarrhea. The stool showed sodium 97 mEq/L, potassium 28 mEq/L, and chloride 70 mEq/L, and pH 6; reducing substances were negative.

Biopsy specimens were retrieved from the duodenum by upper gastrointestinal endoscopy. The histopathology of duodenal biopsies strongly suggested MVID because of the pathognomonic electron microscopic findings that were the presence of intracytoplasmic microvillus inclusion bodies in surface epithelial cells and microvillus atrophy (Figure 1). Mutation analysis of peripheral blood samples of the patient showed IVS10-2A > G (c.1323-2A>G) mutation of the MYO5B gene as homozygote.

The patient died of sepsis on Day 44.

3. Discussion

MVID causes total, irreversible intestinal failure. The pathophysiology of the disorder results from a congenital lack of apical microvilli in the epithelial cells of the small intestine.[2] Although patients are usually normal at birth, they develop metabolic acidosis and severe hypernatremic dehydration in the first few days of life.

In infancy, metabolic acidosis can result from disorders such as infection, metabolic disease, and cardiac abnormalities. Although the etiology is established easily in many cases, it sometimes remains obscure. We considered metabolic disease because of the consanguineous parents and the sibling who died of an unknown cause. However, there were no laboratory findings of amino acidemia, organic acidemia, lactic acidosis, or ketoacidosis. We also excluded sepsis and congenital cardiac abnormalities based on the clinical and laboratory findings.

MVID causes secretory diarrhea characterized by pH > 5.0, negative reducing substances, and elevated electrolyte levels. Our patient's stool analysis strongly supported secretory diarrhea.[3]

There were identified different mutations causing MVID in MYO5B gene in the literature. Our case had IVS10-2A > G (c.1323-2A>G) mutation of the MYO5B. A male patient from a consanguineous family with an A to G transition at nucleotide 1323 of the MYO5B gene was reported by Müller et al.[4] Similar to our case, the patient presented with severe early onset MVID.

In conclusion, MVID is one of the most severe causes of intractable metabolic acidosis. The symptoms of MVID are severe watery diarrhea, which is often mistaken for urine because it is clear and contains no solids. The diagnosis should be considered in a neonate developing intractable metabolic acidosis, weight loss, and hypernatremic dehydration within the first week of life.

Conflicts of interest

The authors have no conflicts of interest relevant to this article.

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