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Pediatric Abdominal Migraine Improved by Valproic Acid: A Case Report

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Abstract

Statement of the Problem: Between 0.2% and 4.1% of children experience abdominal migraines, a type of functional abdominal pain disorder. It consists of episodes of acute, paroxysmal abdominal pain that come and go and are accompanied by symptoms like pallor, nausea, vomiting, anorexia, headaches, and photophobia. Individuals who have abdominal migraine report a lower quality of life, rendering it an important diagnosis. Preventive measures are the main focus of treatment, which mostly consists of nonpharmacologic methods. Analgesics and antiemetics, which are commonly used as abortive treatments for migraine headaches, are examples of such drugs.

The purpose of this study: in this report, we will present a case of abdominal migraine in a 7-year-old female child. She had been experiencing intermittent, hours-long abdominal pain for 4 months which was resistant for conventional therapy using analgesics. The patients showed marked improvement after receiving oral valproic acid.

Keywords: *Abdominal migraine, valproic acid*

Introduction

Abdominal migraine is defined as paroxysmal attacks of intense, acute periumbilical, midline, or diffuse abdominal pain that lasts for at least 1 hour and interfere with normal activities **[**1**]**. The pain can be associated with nausea, vomiting, headache, anorexia, photophobia, and pallor. The attacks are separated by weeks or months **[**2**]**. In children, abdominal migraine is a source of chronic and repeated abdominal pain that interferes with daily activities and overall quality of life **[**3**]**. There are no set rules for treating abdominal migraines, and the majority of available therapies are based on small studies involving relatively few young patients. The first step in management should involve non-pharmacotherapeutic interventions like education and assurance, avoiding triggers, and dietary changes **[**4**]**. Only when these initial interventions fail should drug therapy be taken into consideration **[**5**]**.

Case Presentation

A 7-year-old female who was known for being a sickle cell trait, had been experiencing intermittent, hours-long abdominal pain for 4 months. The pain was primarily peri-umbilical, moderate in intensity, non-radiating, and was linked to pallor. There were no reported aggravating or reliving factors, and the pain was not radiating nor was it related to food intake. She previously experienced constipation, but it got better after receiving moivcol.

No history of fever, nausea, vomiting, or diarrhea was present. Her other systemic reviews were unremarkable, and she had no history of headaches, photophobia, loss of consciousness, abnormal movement, or history of weight loss. The patient reported a family history of migraine, including her cousin, but there was no significant prior medical or surgical history.

Physically, the patient was stable, afebrile, hydrated, and otherwise healthy. Her vital signs were stable, there was no pallor, icterus, or dysmorphic features, and all of her anthropometric measurements were within the normal range. Her systemic examination was unremarkable, and her abdominal examination revealed tendresses primarily in the right iliac and periumbilical fossa.

The patient had multiple ER visits and was readmitted frequently due to abdominal pain; despite receiving analgesia, nothing changed.

The patient has undergone a series of tests over the past four months, all of which have come back normal. These tests include a complete blood count, reticulocyte count, serum amylase, serum lipase, liver function tests, renal function tests, anti-tissue transglutaminase antibody (anti-TTG), urine, stool analysis, and colonoscopy. The electroencephalogram (EEG) study was unremarkable.

After exclusion of other organic causes of abdominal pain, the patient was diagnosed with abdominal migraine, and after receiving valproic acid orally for one week, the patient showed no symptoms during the follow-up.

Discussion

Abdominal migraine is a syndrome characterized by episodes of recurrent severe abdominal pain, nausea, and/or vomiting, that interferes with normal daily activities but with periods of wellness between episodes **[**1**]**. Despite the syndrome's widespread acceptance among medical professionals, little is known about how to treat it. Few studies report treatment of abdominal migraine successfully using the migraine preventative valproic acid (VPA) **[**4**]**.

Valproate (VPA) has a broad range of biochemical actions. It increases gamma-amino butyric acid (GABA) brain levels and interacts with GABA receptors, decreasing migraine attacks **[**6**]**. Two small retrospective studies were reported included 31 and 12 adolescents in an outpatient headache clinic and pediatric clinic, respectively **[**7,8**]**.

In the first study, 31 adolescent patients were treated with intravenous valproate for an acute migraine attack, after failure of conventional treatment; 25 patients received 1000 mg of intravenous valproic, while 6 received an extra 500 mg bolus. Efficacy was measured using a 10-point numerical pain scale (0 = no pain, 10 = severe pain), comparing baseline severity of pain to pain following VPA infusion(s). Twenty-five patients (80%) reported 40% pain reduction within 63 ± 31 min. Almost half of the patients (46.8%) had at least a major improvement in headache pain **[**7**]**.

The second study included 12 pediatric patients, given either 1000 mg (9 of 12 patients) or 500 mg (3 of 12 patients). Mean pain reduction from time of presentation to before VPA administration was 17%. However, after VPA administration, an additional 36% pain reduction in pain after VPA was seen and 10 patients were discharged **[**8**]**.

Tan and colleagues **[**9**]** conducted a case study on 12-year-old child diagnosed with abdominal migraine. She had a 6-year history of episodic abdominal pain and intermittent headaches who was self-inducing vomiting for pain relief. Her cyclic vomiting episodes were associated with confusion, aggressive behavior including biting and scratching, and self-mutilation. Her behavioral issues were present only as pain, emesis, and dehydration. The patient showed minor response to intravenous ondansetron and dihydroergotamine after failure of conventional analgesic and antiemetic therapies. During periods of intense agitation, she had trials of risperidone, haloperidol, chlorpromazine, lorazepam, and diphenhydramine.

In the following attacks, she received IV valproic acid (500 mg), which was rapidly titrated to achieve a serum valproic acid level between 100 lg/dl and 120 lg/dl. On each occasion, IV valproic acid led to a rapid resolution of her symptoms of abdominal pain and vomiting, with a concurrent reduction in her symptoms of agitation **[**9**]**.

Valproic acid's mechanism of action in treating migraine headaches is not completely understood, but it may be due to its effect on brain GABA level, the main inhibitory neurotransmitter **[**10**]**. Valproic acid increases brain GABA levels through several mechanisms, including blocking GABA reuptake, inhibiting the enzymes that break down GABA, and increasing GABA release from nerve terminals **[**11**]**.

In migraine, there is increased activity of excitatory amino acids used to synthesize GABA. Hence, the increased GABA effect from treatment with valproic acid may inhibit these excitatory amino acids and, hence, inhibit migraine **[**12**]**.

Conclusion

The current case illuminated the potential effect of use of valproic acid in treatment of abdominal migraine in pediatric patients. This beneficial effect must be targeted in future studies in patients with abdominal migraine.

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