

Case Report and Review of Literature:

Management of Resistant Cyclic Vomiting Syndrome With a New Empiric Treatment in the Prophylaxis Period: A Case Report and Review of Literature



Sanaz Mehrabani^{1*} , Leila Moslemi² 

1. Non-communicable Pediatric Diseases Research Center, Health Research Institute, Babol University of Medical Sciences, Babol, Iran.

2. Health Reproductive Research Center, Sari Branch, Islamic Azad University, Sari, Iran.



Citation Mehrabani S, Moslemi L. Management of Resistant Cyclic Vomiting Syndrome With a New Empiric Treatment in the Prophylaxis Period: A Case Report and Review of Literature. *Journal of Pediatrics Review*. 2021; 9(1):67-70. <http://dx.doi.org/10.32598/jpr.9.1.344.2>

 <http://dx.doi.org/10.32598/jpr.9.1.344.2>



Article info:

Received: 10 Mar 2020

First Revision: 09 Jun 2020

Accepted: 22 Jun 2020

Published: 01 Jan 2021

Key Words:

Cyclic vomiting syndrome, Treatment, Olanzapine, Aripiprazole

ABSTRACT

Introduction: Cyclic Vomiting Syndrome (CVS) is an idiopathic disorder, identified by recurrent stereotypic episodes of severe nausea and vomiting and intervals of normal health between episodes. There is no specific diagnostic test for CVS, and clinical features are relied on for diagnosis. Many medications have been used to treat CVS, such as antiemetic, anti-migraine, and sedative medications. Nevertheless, treatment is difficult in some resistant cases.

Case Presentation: We report a child with frequent and intensive vomiting episodes after an asymptomatic 2-year period. The patient was unresponsive to many medications but was successfully treated with chlorpromazine and then controlled using olanzapine, followed by aripiprazole. We also performed a brief literature review related to this case report in international databases.

Conclusions: Since CVS management has remained challenging to the clinician in the severe and resistant patients, the empiric treatment of CVS is recommended.

* Corresponding Author:

Sanaz Mehrabani, MD.

Address: Non-Communicable Pediatric Diseases Research Center, Health Research Institute, Babol University of Medical Sciences, Babol, Iran.

Tel: +98 (11) 32346963

E-mail: mehrabanasanaz@gmail.com

1. Introduction

Cyclic Vomiting Syndrome (CVS) is a chronic functional gastrointestinal disorder characterized by recurrent stereotypic episodes of severe nausea and vomiting. CVS episodes, which have a sudden onset, persist for 1-5 days and are characterized by symptom-free intervals (1, 2). The mean age of CVS onset is 5 years in children, with a preference for girls (3). There is no specific diagnostic test for CVS, and clinical features are used for diagnosis. CVS is generally identified based on pediatric Rome IV criteria, and its diagnosis of exclusion is made following extensive examination for other possible causes with similar patterns (4).

In this report, we present the case of a child with persistent CVS, who was managed by chlorpromazine in the vomiting phase and received preventive therapy using olanzapine and then aripiprazole. A brief literature review was also performed related to this case report in international databases such as PubMed and Google scholar.

2. Case Presentation

We present a 6-year-old boy with a 2-year history of monthly episodes of cyclic vomiting. Vomiting was first non-bilious and then became bilious for 3 days. He had a history of gastroesophageal reflux and food allergy and a family history of migraine headaches (in the mother). Upon admission, extensive investigations were carried out, including upper Gastrointestinal (GI) endoscopy, abdominal and pelvic ultrasounds, upper GI and small bowel series, brain MRI, Electroencephalography (EEG), and laboratory tests (i.e. complete blood cell count, urinalysis, Na, K, Cl, blood urea nitrogen, creatinine, glucose tests, and metabolic assays such as liver function, amylase, lipase, and venous blood gas tests), all of which were normal. On the physical examination, moderate dehydration and mild epigastric tenderness were observed. Finally, the diagnosis of CVS was confirmed.

Since CVS episodes occurred twice per month and persisted for 7-10 days, prophylactic therapy was initiated, which consisted of oral amitriptyline (0.5 mg/kg), propranolol (0.5 mg/kg), and cyproheptadine (0.25 mg/kg) daily. Prophylaxis continued for two years, and the patient became vomiting-free. However, as soon as the patient terminated preventive therapy, her CVS episodes recurred, and he was referred to a pediatric hospital. The first attack was controlled via hydration and intravenous ondansetron after 10 days. Prophylaxis was initiated with the same regimen, but after 7 days,

an episode of vomiting occurred. Vomiting was intense (10 times/hour) and unresponsive to intravenous hydration and intravenous ondansetron (0.4 mg/kg/q6h) and diazepam (0.1 mg/kg/q12h). Frequent vomiting continued for 10 days.

Based on the psychological consultation, the patient was transferred to a quiet private room with subdued lighting and received intramuscular chlorpromazine (0.2 mg/kg), along with careful monitoring of vital signs. After two days of treatment, the patient recovered completely. Prophylactic treatment was then applied using oral olanzapine (2.5 mg) twice a day, which gradually decreased and stopped completely. Next, aripiprazole (2.5 mg/d), along with propranolol (20 mg/d), was initiated. During the 1-year follow-up, the patient was asymptomatic.

3. Discussion and Review of Literature

CVS is classified as an idiopathic disorder and the second cause of recurrent vomiting in children (3). Although vomiting is self-limited, intense episodes can cause dehydration, electrolyte disturbances, and complications. Therefore, its management seems necessary (5, 6). Generally, the goal of treatment is to reduce the frequency and severity of CVS episodes. It appears that the most controversial aspect of CVS treatment is the selection of an effective treatment regimen and duration of medical therapy (4). Treatment of CVS can involve abortive, rescue, and prophylactic medications.

In this report, we present a case of CVS in a boy with frequent vomiting episodes after an asymptomatic 2-year period, who did not respond to the treatment regimens. Although there are few reports about the medications used for similar cases, our prescribed regimen was found to be effective in both the vomiting phase and prophylaxis period. Since sleep decreases the vomiting frequency, chlorpromazine, as an antipsychotic drug with sedative and anxiolytic effects, can be useful (7). In the literature review, there was only one report of chlorpromazine administration by Özdemir et al. (8), who used it on a 19-year-old female with CVS (Table 1).

She experienced nausea and vomiting 10 to 12 times per year, and each one lasted 6-7 days since 7 years ago. There was no history of concomitant headache attacks. The first diagnosis was migraine patient, but there was no improvement from prophylactic therapy with amitriptyline (35 mg/d), topiramate (50 mg/d), flunarizine (10 mg/d), propranolol (100 mg/d), erythromycin (1 g/d), cyproheptadine (10 mg/d) and from the

Table 1. Reviewed literature of published cases with cyclic vomiting syndrome

Authors	Year of Study	Age	Sex	Study Design	Drugs
Açikel et al. (10)	2016	6 years	Male	Case report	Aripiprazole
Özdemir et al. (8)	2014	19 years	Female	Case report	Chlorpromazine
Taşdelen & DB (11)	2008	12 months	Male	Case report	Olanzapine+Penicillin
Haghighat et al. (4)	2007	5.0±3.3 years	88 males and 93 females	Cross-sectional	92% propranolol

Journal of Pediatrics Review

acute therapy of ondansetron (4 mg/d), dimenhydrinate (100 mg/d), metoclopramide (15 mg/d) in the vomiting phase. The biochemical analysis, Electroencephalography (EEG), and cranial MRI were normal. A gastroenterologist administered intravenous chlorpromazine 0.2 mg/kg, 2 times/day in 1000 mL of saline. On the first day, her symptoms diminished, and after 3 days of treatment, she recovered completely. Finally, oral chlorpromazine 0.25 mg/kg/d was administered during the vomiting phase. During 6 months follow-up, vomiting intervals decreased, and at the end of the first year, his symptoms were resolved entirely (8). Since the side effects of chlorpromazine require close monitoring, it was only administered during the vomiting phase. The patient's symptoms decreased and then remitted, but chlorpromazine was not prescribed in the prophylaxis period.

In the present case, preventive therapy was applied using olanzapine and then aripiprazole. Olanzapine, with anti-anxiety effects, can improve sleep quality and relieve chemotherapy-induced nausea and vomiting (9). In our case, after initiating olanzapine, vomiting was under control, and the patient's appetite returned to normal.

Açikel et al. reported a 6-year old patient with autism who suffered from frequent vomiting. It occurred once or twice every day for the past 3 years. Physical examination and endoscopy were unremarkable. Risperidone 0.5 mg was initiated for Autism Spectrum Disorder (ASD), and no improvement was observed during 3 months follow-up. Then aripiprazole started that did not improve hyperactivity and irritability but stopped vomiting episodes completely. This regime continued for 6 months, and the child did not experience any vomiting episodes. Six months later, her parents stopped aripiprazole arbitrarily, as the disruptive behaviors did not improve. However, her vomiting episodes recurred after cessation of aripiprazole (10). In general, aripiprazole, with antagonistic effects on dopamine, serotonin, and histamine receptors, is useful in treating CVS and may lead to the cessation of vomiting.

In previous studies on an extensive series of Iranian children with CVS, several empiric treatments have been reported for these children, 92% of whom responded to propranolol in prophylactic therapy. A few patients were non-responsive to propranolol, amitriptyline phenobarbital, and cyproheptadine drugs. The lack of response was unclear. They had severe attacks than the responsive group (4). Taşdelen et al. presented a 12 months infant who had CVS. Because of the antiemetic and anxiolytic effects, olanzapine 5 mg/d was started. Her symptoms decreased in 6 months. Prophylactic penicillin treatment was added for recurrent upper respiratory system infections additionally. Complete remission was seen by combination regimen olanzapine plus penicillin in 18 months (11). However, it should be noted that the efficacy of no specific treatment for CVS has been confirmed, and these reports showed that chlorpromazine and both olanzapine and aripiprazole are safe options for the vomiting phase and prophylaxis period, respectively. Therefore, it is suggested that CVS, especially resistant CVS, is managed using new empiric treatments.

Ethical Considerations

Compliance with ethical guidelines

The Ethics Committee of Babol University of Medical Sciences approved the study (IR.MUBABOL.HRI.REC.1398.032), and an informed consent was obtained from the parents.

Funding

This case report received no specific grant from funding agencies in the commercial, public, or not-for-profit sectors.

Authors' contributions

Both authors equally contributed to preparing this article.

Conflicts of interest

The authors declared no conflict of interest.

Acknowledgements

The authors are deeply thankful for the cooperation of the child and her parents.

References

- Hikita T, Kodama H, Ogita K, Kaneko S, Nakamoto N, Mimaki M. Cyclic vomiting syndrome in infants and children: A clinical follow-up study. *Pediatric Neurology*. 2016; 57:29-33. [DOI:10.1016/j.pediatrneurol.2016.01.001] [PMID]
- Moses J, Keilman A, Worley S, Radhakrishnan K, Rothner AD, Parikh S. Approach to the diagnosis and treatment of cyclic vomiting syndrome: A large single-center experience with 106 patients. *Pediatric Neurology*. 2014; 50(6):569-73. [DOI:10.1016/j.pediatrneurol.2014.02.009] [PMID]
- Hayes WJ, VanGilder D, Berendse J, Lemon MD, Kappes JA. Cyclic vomiting syndrome: Diagnostic approach and current management strategies. *Clinical and Experimental Gastroenterology*. 2018; 11:77-84. [DOI:10.2147/CEG.S136420] [PMID] [PMCID]
- Haghighat M, Rafie SM, Dehghani SM, Fallahi GH, Nejabat M. Cyclic vomiting syndrome in children: Experience with 181 cases from southern Iran. *World Journal of Gastroenterology (WJG)*. 2007; 13(12):1833. [DOI:10.3748/wjg.v13.i12.1833] [PMID] [PMCID]
- Li BU. Cyclic vomiting syndrome: Light emerging from the black box. *The Journal of Pediatrics*. 1999; 135(3):276-7. [DOI:10.1016/S0022-3476(99)70119-8]
- Fleisher DR, Matar M. The cyclic vomiting syndrome: A report of 71 cases and literature review. *Journal of Pediatric Gastroenterology and Nutrition*. 1993; 17(4):361-9. [DOI:10.1097/00005176-199311000-00005] [PMID]
- Forbes DFS. Cyclic Nausea and vomiting syndrome in children. *Australian Family Physician*. 2008; 37(1-2):33-6. [PMID]
- Ozdemir H, Bulut S, Berilgen MS, Kapan O, Balduz M, Demir C. Resistant cyclic vomiting syndrome successfully responding to chlorpromazine. *Acta Medica (Hradec Kralove)*. 2014; 57(1):28-9. [DOI:10.14712/18059694.2014.5] [PMID]
- Kast R, Foley K. Cancer chemotherapy and cachexia: Mirzapine and olanzapine are 5-HT₃ antagonists with good anti-nausea effects. *European Journal of Cancer Care*. 2007; 16(4):351-4. [DOI:10.1111/j.1365-2354.2006.00760.x] [PMID]
- Açikel B, Yar A, Hergüner S. Functional vomiting treated successfully with aripiprazole in a child with Autism Spectrum Disorder. *Journal of Child and Adolescent Psychopharmacology*. 2016; 26(2):177-8. [DOI:10.1089/cap.2015.0202] [PMID]
- Taşdelen Bİ, DB Ö. Cyclic Vomiting Syndrome: A case report. *Siklik Kusma Sendromu: Bir olgu sunumu. Literatür Sempozyum*. 2015; 1:2-4. http://www.literatursesmpozyum.com/pdf/m_1427291293.pdf