

The prognosis of cyclical vomiting syndrome

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Abstract

Aims—The medium term prognosis of cyclical vomiting syndrome (CVS) was studied to determine the proportion of affected individuals who had gone on to develop headaches fulfilling the International Headache Society criteria for migraine.

Methods—Twenty six (76%) of 34 CVS sufferers identified from the authors' clinical records were traced, and all agreed to participate. Each child was matched to a control, and telephone interviews were conducted using a standardised questionnaire.

Results—Thirteen (50%) of the subjects had continuing CVS and/or migraine headaches while the remainder were currently asymptomatic. The prevalence of past or present migraine headaches in subjects (46%) was significantly higher than in the control population (12%).

Conclusion—Results support the concept that CVS is closely related to migraine.

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Keywords: migraine; cyclical vomiting syndrome; headache

Cyclical vomiting syndrome (CVS), first described by Gee,¹ is a childhood condition with an estimated prevalence of 1.9%.² It is characterised by recurrent, sudden, and self limiting episodes of nausea, vomiting, and lethargy during which the child looks pale, ill, and miserable.³⁻⁵ Each attack lasts from a few hours to a few days, and there is complete resolution of symptoms between attacks.

The aetiology of the condition is uncertain. It has been linked to epilepsy,⁶⁻⁷ psychological problems,⁸⁻¹⁰ metabolic disorders,¹¹ and autonomic dysfunction¹² but in the great majority of children no abnormality is found. Many authors consider that CVS is a "migraine equivalent".¹³ In a previous study,¹⁴ we found a similar pattern of associated symptoms in children with CVS and those with abdominal migraine, also considered a migraine equivalent. We have also noted relations between CVS and migraine in an epidemiological study; in particular, children with CVS have an excess of migraineurs among their first degree relatives.²

Also supportive of a relation to migraine is the response of CVS to antimigraine drugs. It may respond to pizotifen,⁸⁻¹⁵ a serotonin antagonist, to propranolol,¹⁶ and to cyproheptadine,¹⁷ an antihistamine with serotonin antagonism and calcium blocking properties, all of which are used in the prophylaxis of migraine. A positive response has also been noted in a case treated with sumatriptan,¹⁸ a 5-HT₁

agonist used in the acute management of migraine.

Further support for a relation between CVS and migraine comes from electrophysiological studies. Quantitative electroencephalogram (EEG) changes in CVS are similar to patterns recorded in migraine.¹⁹ Good²⁰ performed a detailed analysis of visual evoked responses, and identified similarities between CVS and migraine, with or without aura.

Although the links between CVS and migraine are widely (although not universally²¹) accepted, it is unclear if children with CVS continue to have attacks of vomiting as they get older, or if the condition transforms into more typical migraine. We have therefore examined the medium term prognosis of CVS to determine the proportion who have gone on to develop headaches that fulfil the International Headache Society²² criteria for migraine.

Methods

ETHICAL APPROVAL

The study was approved by the Joint Ethical Committee of the University of Aberdeen and Grampian Health Board.

POPULATION

Subjects were identified from clinical records maintained by DNKS, IAA, and GR. We identified 34 individuals in whom a diagnosis of CVS had been made, based on previously published criteria² (see table 1). We identified controls, matched for sex and week of birth, by using the hospital birth records; three potential controls were found for each case and were contacted in turn until one responded.

QUESTIONNAIRE BASED TELEPHONE INTERVIEWS

An initial letter was sent to the home address of each child, detailing the aims of the study and explaining that they would subsequently be contacted by telephone. At telephone interview, we then enquired about headache and vomiting in the past year. We used a previously validated headache questionnaire²³; table 2 shows additional questions on cyclical vomiting.

Table 1 Criteria for the diagnosis of cyclic vomiting

At least three episodes in the past year, in an otherwise apparently healthy child, of unexplained nausea and vomiting that were:

- sudden in onset
- self limiting
- accompanied by pallor, lethargy, and misery
- not associated with gastrointestinal or systemic symptoms between attacks

Table 2 Questions relating to cyclic vomiting attacks

Do you suffer from vomiting attacks?
If you are sick, do you also get pain?
Is there anything you feel causes an attack?

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Table 3 The prognosis of cyclic vomiting syndrome

	Total (n = 26)		Boys (n = 11)		Girls (n = 15)	
	Subjects n (% total; 95%CI)	Controls n (% total; 95%CI)	Subjects n (%)	Controls n (%)	Subjects n (%)	Controls n (%)
No current CVS	18 (69; 48.2 to 85.7)	25 (96; 80.4 to 99.9)	10 (91)	11 (100)	8 (53)	14 (93)
No migraine headache at any time	8 (31; 14.3 to 51.8)	23 (88; 69.8 to 97.6)	4 (36)	10 (91)	4 (27)	13 (86.7)
Current migraine headache	5 (19; 6.6 to 39.3)	2 (8; 0.1 to 25.1)	3 (27)	1 (9)	2 (13)	1 (7)
Previous migraine headache, now resolved	5 (19; 6.6 to 39.3)	0 (0; 0 to 13.2)	3 (27)	0 (0)	2 (13)	0 (0)
Current CVS	8 (31; 14.3 to 51.8)	1 (4; 0.1 to 19.6)	1 (9)	0 (0)	7 (47)	1 (7)
No migraine headache at any time	6 (23; 9.0 to 43.6)	0 (0; 0 to 13.2)	1 (11)	0 (0)	5 (33)	0 (0)
Current migraine headache	2 (8; 0.1 to 25.1)	1 (4; 0.1 to 19.6)	0 (0)	0 (0)	2 (13)	1 (7)
Total migraine headache, past or present	12 (46; 26.6 to 66.6)	3 (12; 2.5 to 30.2)	6 (55)	1 (9)	6 (40)	2 (13)

ing. In addition to questioning the child, one parent, usually the mother, was consulted to confirm the accuracy of the information.

STATISTICAL ANALYSIS

The proportions of symptomatic subjects were compared using the χ^2 test.

Results

TELEPHONE INTERVIEWS

Of the 34 children fulfilling our criteria for CVS, current addresses were available for 26 (76%). These comprised 15 females and 11 males, and all agreed to participate in the study. The mean age of respondents was 17 years. There were no significant age or sex differences between those who could and could not be traced.

PROGNOSIS OF CVS

Table 3 presents the results. Of the CVS subjects, eight (31%) were still experiencing vomiting attacks. Twelve (46%) had a current or previous history of headaches that fulfilled the International Headache Society criteria for migraine, compared to only three (12%) of the controls, a difference that was statistically significant (using Fisher's exact test, two tailed, $p = 0.0128$).

Discussion

This investigation is the first case control study to follow up a population of children previously diagnosed with CVS. There is no laboratory test to confirm the diagnosis of CVS, but we have found our clinical criteria easy to apply in both clinical²⁴ and epidemiological² settings. Although confusion might arise in psychological disorders such as anorexia nervosa and bulimia, in metabolic disorders such as urea cycle disorders, organic acidaemias, and mitochondrial myopathy, encephalopathy with lactic acidosis and stroke (MELAS), raised intracranial pressure, and infections, especially of the urinary tract, there are usually other clues to these disorders.

We chose to approach our patients for telephone rather than personal interview because our hospital service covers a wide geographic area, and clinical interviews in the hospital were unlikely to find favour with families living at a distance. In addition, commitments at school, college, and work make attendance problematical for this age group. The diagnosis of migraine is based on symptoms, and there are no diagnostic clinical or laboratory findings, so that clinical examina-

tion will only rarely influence the diagnosis. We experienced no problems in applying the questionnaire by telephone, and found it easy to interview the teenage subjects and to obtain confirmatory details from a parent.

This follow up study of patients with CVS indicates a strong predisposition on the part of sufferers to develop migraine headache. Almost half had experienced typical migraine headaches, 27% currently and 19% previously. In contrast, only 12% of the control population had ever had migraine, a figure similar to that found in larger populations.²⁵ In a previous study,¹² we found that 38% of children also suffered from migraine headaches at the time they consulted for CVS. The present study suggests that this proportion increases with the passage of time. Generally, the onset of CVS precedes that of migraine headaches,²⁶ being at the ages of 5.3 and 8.3 years respectively in our local school population.^{2, 23} It may well be that our findings reflect the tendency for migraine to present with abdominal symptoms in early childhood, with some but not all going on to develop migraine headache as they get older.

About one third of our subjects continued to suffer from cyclical vomiting attacks well into their teens, a finding in keeping with previous reports.^{27, 28} It is therefore inappropriate to regard CVS as a purely paediatric condition that disappears at puberty or during adolescence. Not only do sufferers tend to develop migraine headaches, but many also continue to have episodic vomiting.

Our results confirm that there is an association between CVS and migraine headaches and that in a significant proportion of children, the condition transforms into typical migraine headache.

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Helping disaster victims

A doctor working for the disaster relief programme of the Pan American Health Organisation and the World Health Organisation (Claude de Ville de Goyet. *Lancet* 2000; **356**: 762-4) has made some pungent points about response to disasters.

He points to five "myths": that dead bodies are a major health hazard; that immediate outside help is always needed and helpful; that people behave badly after disasters; that the local population is usually too shocked to help itself; and that things soon get back to normal. The reality, he insists, is that dead bodies do not cause epidemics and the belief that they do leads to hasty, unceremonious, and unseemly disposal of the dead. Foreign teams of experts may have a false idea of local needs, they are not always needed urgently, and when they do arrive they should cooperate more with local workers. Most people respond well to catastrophe, and lawlessness and corruption are the exception rather than the rule. Similarly, far from being too shocked, local people are usually enthusiastic and dedicated volunteers. The effects of disaster are long lasting but international interest and attention are short lived and help may dry up. Early donations are often plentiful but may include inappropriate goods when money would be better.

The World Bank recently announced that, in future, 15% of its emergency relief grants will go towards reducing vulnerability to disasters and Dr de Ville de Goyet commends this approach to others.

ARCHIVIST