

MANAGEMENT OF VOMITING: INTERRELATION BETWEEN AGE, MODE OF PRESENTATION, AND SYMPTOMS

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MANAGEMENT OF VOMITING: INTERRELATION BETWEEN AGE, MODE OF PRESENTATION, AND SYMPTOMS

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Abstract: The present article addresses vomiting in paediatric emergencies, focusing on aetiology. The signs and symptoms, as well as the age of the child are assessed and linked to the probable causal factors of this clinical feature in order to guide the therapeutic intervention. Clinical studies and current systematic reviews have been consulted for the preparation of this article.

Keywords: Vomiting, Child Guidance.

MANAGEMENT OF VOMITING: INTERRELATION BETWEEN AGE, MODE OF PRESENTATION, AND SYMPTOMS

MANEJO DE LOS VÓMITOS: INTERRELACIÓN ENTRE LA EDAD, EL MODO DE PRESENTACIÓN Y LA SINTOMATOLOGÍA

Resumen: En este artículo se realiza un abordaje de los vómitos en urgencias pediátricas centrando el enfoque en la etiología. Para ello se valoran los signos y síntomas presentes así como la edad del niño y se relacionan con los posibles factores causales que han generado este cuadro clínico, para poder orientar la intervención terapéutica. Se han consultado estudios clínicos y estudios de revisiones sistemáticas actuales para la elaboración del artículo.

Palabras clave: Vómitos, Orientación Infantil.

GESTÃO DOS VÓMITOS: INTER-RELAÇÃO ENTRE A IDADE, O MODO DE APRESENTAÇÃO E A SINTOMATOLOGIA

Resumo: Neste artigo, é feita uma abordagem dos vómitos nas urgências pediátricas centrando a abordagem na etiologia. Para este efeito, são avaliados os sinais e sintomas presentes, assim como a idade da criança e é feita uma associação com os possíveis fatores causais que geraram o quadro clínico, para poder orientar a intervenção terapêutica. Foram consultados estudos clínicos e estudos de revisões sistemáticas atuais para a elaboração do artigo.

Palavras-chave: Vómitos, orientação infantil.

MANAGEMENT OF VOMITING: INTERRELATION BETWEEN AGE, MODE OF PRESENTATION, AND SYMPTOMS

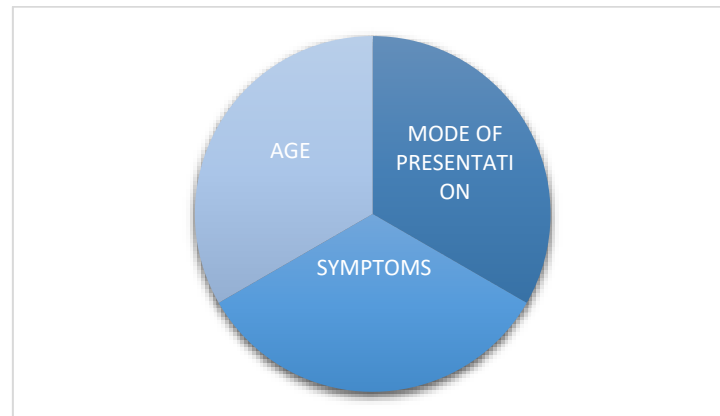
VOMITING

Vomiting is a very common symptom in children. Determining its relationship with potentially dangerous conditions, as well as its diagnosis and treatment depends on both the age of the child and the mode of presentation of this symptom.

The assessment of the impact of this clinical feature on the child's general state (lack of energy, drowsiness, pallor) and hydroelectrolytic metabolism is decisive. The child usually presents in a stable situation and we are able to conduct a case history and initial examination focusing on the following:

- Presence of fever
- Digestive symptoms and intestinal pattern: nausea, vomiting, and presence of diarrhoea.
- Activity pattern: appetite, sleep, play, and reactivity.
- Presence of thirst and signs of dehydration: decreased skin turgor, sunken fontanelles.
- Respiratory pattern: frequency and depth of breathing (pH alteration). (Shields & Lightdale, 2018)

Figure 1. Interrelation between age, mode of presentation, and symptoms



Fuente: Shields & Lightdale, 2018

MANAGEMENT OF VOMITING: INTERRELATION BETWEEN AGE, MODE OF PRESENTATION, AND SYMPTOMS

AETIOLOGICAL APPROACH

The etiology of vomiting (and nausea) to facilitate a precise and rapid approach based on the variables shown in Table 1. Pattern by age

Table 1. Pattern by age

PATTERN	0-1 month(s)	1-12 month(s)	1-4 year(s)	5-11 years	12-14+ years
ACUTE	Food intolerance	Foreign body	Foreign body	Appendicitis	Cholelithiasis
	Hirschprung disease	Food intolerance	Laryngitis	Diabetic ketoacidosis	Diabetic ketoacidosis
	Drug poisoning	Drug poisoning	Drug poisoning	Drug poisoning	Drug poisoning
	Sepsis	Increased ICP	Toxic ingestion	Pancreatitis	
	Meningitis	Otitis media	Otitis media	Otitis media	
	Pyloric stenosis	UTI. Kidney disease	Constipation		
	Bile duct alteration	Intussusception	UTI		
	Intestinal atresia	AGE	AGE		
		Toxic ingestion			
		Bile duct alteration			
	Pancreatitis				
	Rumination				
CHRONIC	Adrenal insufficiency	GERD	Coeliac disease	Coeliac disease	Bezoar
	GERD		Eosinophilic oesophagitis	Eosinophilic oesophagitis	Pregnancy
	Hirschprung disease			Gastritis +/- <i>H. pylori</i>	Drug addiction (THC)
	Bile duct alteration			Gastroparesis	
	Intestinal atresia			Peptic ulcer disease	
CYCLIC	Adrenal insufficiency	Adrenal insufficiency	Adrenal insufficiency	Cyclic vomiting syndrome	Abdominal migraine
	Inborn errors of metabolism	Intussusception	Constipation	Urinary obstruction	Drug use (THC)
	Malrotation with volvulus	Malrotation with volvulus			Cyclic vomiting syndrome
					Eating disorder
				Superior mesenteric artery syndrome	

* UTI: urinary tract infection / ICP: intracranial pressure / AGE: acute gastroenteritis / GERD: gastroesophageal reflux disease / THC: tetrahydrocannabinol.

Source: Di Lorenzo C. Approach to the infant or child with nausea and vomiting Up to Date 2019 y Shields & Lightdale, 2018 (traducido por los autores)

It should be noted that the presence of enamel lesions may be an early sign of eating disorders (e.g. anorexia, bulimia) even in children (Uhlen, Tveit, Refsholt Stenhagen, & Mulic, 2014).

MANAGEMENT OF VOMITING: INTERRELATION BETWEEN AGE, MODE OF PRESENTATION, AND SYMPTOMS

CLINICAL GUIDANCE BASED ON THE RESULTS OF THE CASE HISTORY AND EXAMINATION

The first thing to do is to find out if we are dealing with a healthy child or if he or she has any illnesses. The epidemiological environment (e.g. AGE, food poisoning) must be investigated, and any history of head or abdominal trauma (duodenal haematoma) must be taken into account. Toxic ingestion is more likely in children aged 1-5 years and adolescents who present with vomiting accompanied by changes in their level of consciousness, ataxia, and multiorgan or “strange” syndromes; even more so if there is a history of pica, or accidental or intended ingestion. Polyhydramnios is a common previous condition in neonates with congenital bowel obstruction (Shields & Lightdale, 2018). See Table 2. Clinical guidance 1.

Table 2. Clinical guidance 1

SYMPTOMS	CLINICAL GUIDANCE
	HISTORY
History of vomiting or diarrhoea in people surrounding the child	AGE
Sudden onset of symptoms (nausea, vomiting, diarrhoea)	<ul style="list-style-type: none"> ▪ Viral gastroenteritis ▪ Infectious diseases (sepsis, enteritis/colitis, appendicitis) ▪ Hirschprung disease associated with enterocolitis
Vomiting in the morning	<ul style="list-style-type: none"> ▪ Pregnancy ▪ Increased ICP ▪ Cyclic vomiting syndrome
Vomiting without nausea (spontaneous vomiting)	Increased ICP
Bilious emesis	Bilious emesis requires an immediate assessment to relieve an intestinal obstruction distal to the angle of Treitz. Non-bilious vomiting is less frequently associated with an obstruction of the gastrointestinal tract. If faeces is detected, a distal obstruction is very likely to be the case (large intestine).
Haematemesis	The blood usually comes from the upper respiratory tract. Sometimes haematemesis is due to Mallory-Weiss syndrome, gastritis caused by anti-inflammatory drugs, etc.
Effortless vomiting	<ul style="list-style-type: none"> ▪ Reflux ▪ Rumination
Periodic episodes of vomiting	<ul style="list-style-type: none"> ▪ Cyclic vomiting syndrome ▪ Metabolic conditions, including porphyria ▪ Migraine (family history) ▪ Oncological conditions ▪ Family dysfunction
Vomiting associated with food ingestion	
Vomiting within a few minutes and up to 2 hours after eating, usually accompanied by skin rashes or respiratory symptoms	Food allergy
Subacute clinical features with diarrhoea	Bowel disease due to food intolerance
After introducing lactose	Galactosaemia

MANAGEMENT OF VOMITING: INTERRELATION BETWEEN AGE, MODE OF PRESENTATION, AND SYMPTOMS

After introducing fructose/sucrose	Hereditary fructose intolerance
Indigestion with vomiting	Achalasia

Source: Shields & Lightdale, 2018

Vomiting is nonspecific in childhood and may be caused by a variety of conditions. Once we have evaluated the degree to which the general state of health has been affected, the priority is to rule out the most serious causes of vomiting in children: surgical abdomen, severe non-surgical abdominal conditions, intracranial infection, intracranial hypertension, sepsis, and severe metabolic disorders (Hyams et al., 2016). See Table 3. Clinical guidance 2.

Table 3. Clinical guidance 2

EXAMINATION	CLINICAL GUIDANCE
	HISTORY
Marked abdominal distension, visible intestinal loops, bilious emesis, absence of bowel movements or borborygmi, flatulence, foul-smelling stools	Bowel obstruction
Hepatosplenomegaly, jaundice	<ul style="list-style-type: none"> ▪ Hepatitis ▪ Viral infection (e.g. mononucleosis) ▪ Metabolic disorders ▪ Epigastrium: pancreatitis, peptic ulcer disease, gastritis
Ataxia, dizziness, nystagmus	Vestibular condition or acute cerebellar ataxia
Papilloedema	Increased ICP
Ambiguous genitalia	Congenital adrenal hyperplasia or adrenal insufficiency
Strange smell (bad breath)	Metabolic problem
Parotid inflammation	Bulimia

Fuente: Hyams et al., 2016

USEFULNESS OF SOME LABORATORY TESTS

The evidence indicates some tests that are easy to interpret and do not require complex resources, which can guide the diagnostic-therapeutic approach, and which are included in the following table.

Table 4. Usefulness of laboratory tests

TEST	CLINICAL GUIDANCE
Blood count	<ul style="list-style-type: none"> ▪ Anaemia and iron deficiency associated with inflammatory bowel disease, peptic ulcer disease, and gastritis. ▪ Leukocytosis is related to bacterial infections.
Electrolytes, Urea/creatinine	<ul style="list-style-type: none"> ▪ Electrolyte alterations are associated with pyloric stenosis, metabolic alterations, and adrenal insufficiency. ▪ Elevated levels of urea and creatinine point to kidney disorders.
Hepatic function	<ul style="list-style-type: none"> ▪ Evaluation of transaminases points to gallbladder conditions.
Ketone bodies	<ul style="list-style-type: none"> ▪ Metabolic disorders: diabetes, galactosaemia. ▪ Prolonged fasting.

Fuente: Shields & Lightdale, 2018

MANAGEMENT OF VOMITING: INTERRELATION BETWEEN AGE, MODE OF PRESENTATION, AND SYMPTOMS

THERAPEUTIC APPROACH

Beyond the aetiological approach, which is of paramount importance, symptom management often focuses on treatment in the community care setting.

Without evidence of severity, improvement in clinical features is achieved by allowing the bowel to rest and maintaining an adequate level of hydration. The basic pillars of the management of AGE are oral rehydration and early feeding. In the case of infants, early feeding should be maintained and, in the rest of children, the intake of hydroelectrolytes should be ensured in accordance with the losses and without forcing early feeding (Shields & Lightdale, 2018).

Together with this, the use of antiemetic medication encourages the positive progression of the most acute symptoms. There are numerous drugs and therapeutic regimens depending on age, the characteristics of the drug, and the clinical features being addressed (Hyams et al., 2016), (Phillips et al., 2010).

Table 5. summarises the most frequently used medications with the greatest evidence for safe use in clinical settings, including their complications or recommendations for the paediatric setting (Frelich et al., 2018), (Tomasik, Ziólkowska, Kołodziej, & Szajewska, 2016).

Table 5. Most frequently used medications

MEDICATION	DOSE	GROUP / RECEPTOR	NOTES
Ondansetron	0.3-0.4 mg/kg per dose every 4-6 h	Serotonin antagonist / 5-HT ₃	May cause diarrhoea
Granisetron	40 µg/kg/dose every 12 h	Serotonin antagonist / 5-HT ₃	
Ginger	250 mg every 8 h	Serotonin antagonist	The mechanism of action of ginger is not completely understood
Amitriptyline	0.25 mg/kg per day (max. 1 mg/kg per day)	Antidepressant / Serotonin	Increased risk of cardiac arrhythmia
Erythromycin	0.5 mg/kg per dose every 6 h	Prokinetic	Can increase risk of pyloric stenosis in infants
Cyproheptadine	0.25-0.5 mg/kg per day	Antihistamine / H ₁	Stimulates appetite
Diphenhydramine	5 mg/kg per day (divided into 3-4 doses)	Antihistamine / H ₁ , D ₂	
Promethazine	5-10 mg/kg every 4-6 h (≥ 40 kg)	Dopamine antagonist / D ₂	Contraindicated in children <2 y old due to respiratory depression
Metoclopramide	0.1-0.2 mg/kg per dose every 4-6 h	Dopamine antagonist / D ₂	Increased risk of tardive dyskinesia (extrapyramidal condition)
Aprepitant	Children 6-30 kg: 3 mg/kg on day 1, then 2 mg/kg on days 2 and 3. Children >30Kg: 125 mg on day 1, then 80 mg on days 2 and 3.	Neurokinin (central) / NK ₁	Indicated for chemotherapy-induced nausea. Causes fatigue, dizziness. Not for long-term use.

Fuente: Shields & Lightdale, 2018

MANAGEMENT OF VOMITING: INTERRELATION BETWEEN AGE, MODE OF PRESENTATION, AND SYMPTOMS

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MANAGEMENT OF VOMITING: INTERRELATION BETWEEN AGE, MODE OF PRESENTATION, AND SYMPTOMS

RINSAD

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