

## Causes of Vomiting in Hospitalized Children

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### Summary:

**Background:** vomiting is a very common symptom of disease in childhood, it occurs both in gastrointestinal and non-gastrointestinal diseases.

**Objectives:** Our aim of the study was to find out the causes of vomiting in different age group, the improper management of vomiting in daily practice and to emphasis on the usefulness of imaging study in the diagnosis.

**Methods:** A prospective study was carried out on patients presented with vomiting admitted to Children Welfare Teaching Hospital from the first of Dec. 2001 to the end of April 2002 .The age ranged between early neonatal periods to 12 years of age.

**Results:** A total of 100 child were included in this study,(65) male (35) female male to female ratio was 1.86:1. Surgical causes of the gastrointestinal tract was the most common cause of vomiting (50 %) in the neonatal period, while infectious cause formed 78.3% & 48.4% during infancy and childhood respectively.

Imaging studies was carried out on 54 patients and helped to reach a final diagnosis in 21(38,9% ) patients.

In this study green color vomiting was found to relate mainly (64.7%) to the intestinal obstruction with a (p) value >0.05.

**Conclusion:** There was no benefit of antiemetic drugs in the treatment of vomiting, Imaging studies were helpful in reaching the correct diagnosis of vomiting in some cases, green color vomiting should make pediatrician suspicious of intestinal obstruction.

**Key words:** children, Vomiting

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### Introduction:

Vomiting is a very common symptom of disease in childhood, it occurs both in gastrointestinal and non-gastrointestinal diseases (1).

Biliary vomitous is a surgical emergency until proved otherwise and should lead to prompt investigations (2).

Vomiting can lead to life threatening severe dehydration, metabolic alkalosis, severe electrolyte depletion .A good history and examination will often give strong pointer to the most likely cause for vomiting (3).

Over the last years, ultrasound has progressively become the primary modality used to assess the acute abdomen. The lack of radiation exposure and high diagnostic efficacy of ultrasound have contributed to borden the use of ultrasound(4) .

Treatment is directed toward the underlying disease and toward correction of dehydration and electrolyte disturbance (2).

### Patients and Methods:

This is a prospective study done at Children Welfare Teaching Hospital from first of Dec.2001 to end of April 2002.

The patients who were enrolled in this study their age's range from first day of life up to 12 years old. All patients enrolled in the study were in-patients and had

Frequent vomiting as the only symptom or in association with other symptoms. Patients in the surgical ward were included.

Data were collected by interviewing the mothers of the patients through a special questionnaire and reviewing their case sheets for some investigations, which constituted the following: - Name, Age, Gender

Vomiting only----- or associated with: - Diarrhea, Fever, Constipation, Fit, other symptoms as headache

Color of vomiting: white(milky)----- yellow/green

Character of vomiting: projectile-----non projectile

Use of anti emetic: Yes -----NO

Response to ant emetic: good response----- - no response

Use of other drugs as antibiotics, antipyretics, bronchodilators

Investigations which were done for patients according to their presenting signs and symptoms to

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reach diagnosis: serum electrolytes, blood urea, serum creatinin, liver function test, general urine examination, urine culture and sensitivity, lumbar puncture, blood culture, immune fluorescent antibody test for Kalazar in one patient, serum and urine chromatography.

Imaging studies: Ultrasound, barium study, computed tomography, plain abdominal X-ray

The statistic test used is chi-square test in

which significant value was  $P < 0.05$ .

### Results:

A total of 100 children were included in this study 14 (14%) neonates, 55(55%) infants and 31(31%) children. Male were 65(65%) while female 35(35%), with a male to female ratio (1,86:1), as shown in table (1)

**Table (1) Distribution of 100 patients with frequent vomiting according to gender and age**

Gender	Neonate No.	(%)	Infant < 1 year No.	(%)	Children No.	(%)	Total	(%)
Male	11	(16.9)	36	(55.4)	18	(27.7)	65	(100)
Female	3	(9)	19	(54)	13	(37)	35	(100)
Total	14	(14)	55	(55)	31	(31)	10	(100)

*Male to Female ratio 1,86:1*

Regarding character of vomitus, 11(64.7%) patients out of a total of 17 patients with intestinal surgical problem having projectile vomiting. In 3 patients with surgical problem outside gastro intestinal tract 2 (66.7%) of them have projectile vomiting, and only 1(33.3%) has non-projectile

vomiting. In patients with other causes for vomiting including infection, metabolic causes out of 80 patients 55(68.8%) of them show to have projectile vomiting and 25(31.3%) of them with non-projectile vomiting. As shown in table (4).

**Table (2) relation of character of vomiting to the causes in 100 patients**

Causes	Character		Total
	Projectile	Non projectile	
Intestinal surgical	11 (64.7%)	6 (35.3%)	17 (100%)
Non intestinal surgical	2 (66.7%)	1 (33.3%)	3 (100%)
Others	55 (68.8%)	25 (31.2%)	80 (100%)
Total	68 (68%)	32 (32%)	100 (100%)

Regarding the color of vomiting Eleven 11(64.7%) patients out of 17 patients with intestinal obstruction have green vomitus, while the remaining 6(35.3%) have milky vomitus. In infectious causes for vomiting 8(12.5%) out of 64 patients have green vomitus and the remaining

56(87.5%) have milky vomitus. Other causes for vomiting including metabolic and endocrine in which 3(15.81%) out of 19 patients have green vomitus, as shown in table (3). In neonate 7 patients had intestinal surgical problem, 5(71.4%) of them having green vomitus the remaining 2(28.5%) having milky vomitus, no bilious vomiting was found in other causes for vomiting in neonates.

**Table (3) relation of the color of vomitus to the causes in 100 patients**

Causes	Color		Total
	White(milky)	Green/yellow	
Infection	56 (87.5%)	8 (12.5%)	64 (100%)
Intestinal obstruction	6 (35.3%)	11 (64.7%)	17 (100%)
Others (non obstructive)	16 (84.2%)	3 (15.8%)	19 (100%)
Total	78 (78%)	22 (22%)	100 (100%)

*P*<0.05

Twenty patients received antiemetic drug (metoclopramide) prior to admission, 3(15%) of them were neonates, 13(65%) were infants, 4(20%) were children. Out of 20 patients receiving antiemetics only 3(15%) patients had been shown to have good response in control vomiting, remaining 17(85%) patients shown no response. All patients

treated with injectable antiemetics received only single injection, but two patients received more than two injection. Side effects to antiemetics recorded only in 2 patients: one of them develop extra - pyramidal symptoms, the other develop convulsion.

**Table (4) Response to Antiemetics in 20 patients with frequent vomiting**

Response	Neonate No. (%)	Infant < 1 year No. (%)	Children No. (%)	Total
Positive	0 (0%)	0 (0%)	3 (15%)	3 (15%)
Negative	3 (15%)	13(65%)	1 (5%)	17(85%)
Total	3 (15%)	13(65%)	4 (20%)	20(100%)

Regarding the cause of vomiting in relation to age group, in neonates the most common cause of vomiting was gastro intestinal tract anatomical abnormality forming 7(50%) out of 14 neonates include one case pyloric membrane, two cases duodenal atresia, two cases ilial atresia, one case imperforated anus, and one case tracheo esophageal fistula. Second cause was infectious 6(42.9%), the commonest infection was respiratory tract infection 3(21.4%) followed by sepsis two cases then central nervous system infection only one case.

Third cause was endocrine which was congenital adrenal hyperplasia.

Most common cause in infancy for vomiting was infection which form 43(78.3%) cases out of 55 cases, gastroenteritis was the commonest infection 20(36.5) cases, then respiratory tract infection (pneumonia) 9(16.4%), sepsis 7(12.7%), central nervous system infection 4(7.3%), urinary tract infection 3(5.5%). Surgical causes come second 6(10.9%) out of 55 cases; include 5 cases of gastrointestinal tract surgical problem and other surgical cause outside gastrointestinal tract was

subdural hematoma. Third cause of vomiting in infancy was metabolic cause forming 4(7.2%) cases including two galactosemia, and two lactose intolerance. Endocrine cause forming 1(1.8%) case as congenital adrenal hyperplasia. Other cause was wilms tumour.

In childhood also infection comes as first cause which constitute 15(48.4%) out of 31 patients, respiratory tract infection 4(12.9), gastrointestinal tract infection 3(9.7%), urinary tract infection 3(9.7%) central nervous system infection 2(6.5%), hepatitis 1(3.2%), kala zar 2(6.5%). Second cause was surgical causes forming 7(22.5%) out of 31 cases. Five cases of gastrointestinal tract surgical problem, surgical cause outside gastrointestinal tract were 2 cases of cerebral space occupying lesion. Metabolic causes come third forming 4(12.9%) out of 31 patients, couple of them was chronic renal failure and the others were Diabetic ketoacidosis. Two cases (6.5%) were poisoning with unknown chemical substance. Other causes form 3(9.7%) includes one case Celiac disease, one case nephrotic syndrome, one case Reye syndrome,

as shown in table (5).

**Table (5) relation between causes of vomiting and age groups of 100 patients with frequent vomiting**

Diagnosis	Group			Total
	Neonate No.(%)	Infant No. (%)	Children No. (%)	
1- Infection	6 (42.9)	43 (78.3)	15 (48.4)	64 (64%)
GIT infection (gastroenteritis)		20 (36.4)	3 (9.7)	23 (23)
Respiratory infection (pneumonia)	3 (21.40)	9 (16.4)	4 (12.9)	16 (16)
CNS infection	1 (7.1)	4 (7.3)	2 (6.5)	7 (7)
Sepsis	2 (14.3)	7 (12.7)		9 (9)
UTI(urinary tract infection)		3 (5.5)	3 (9.7)	6 (6)
Hepatitis			1 (3.2)	1 (1)
Kala azar			2 (6.5)	2 (2)
2- Surgical causes: -	7 (50)	6 (10.9)	7 (22.5)	20 (20)
GIT surgical causes	7 (50)	5 (9.1)	5 (16.1)	17 (17)
Non GIT surgical causes (cerebral)		1 (1.8)	2 (6.5)	3 (3)
3- Endocrine (congenital adrenal hyperplasia)	1 (7.1)	1 (1.8)		2 (2)
4- Metabolic (galactosemia&lactose intolerance)		4 (7.2)	4 (12.9)	8 (8)
5- Poisoning			2 (6.5)	2 (2)
6- Other		1 (1.8)	3 (9.7)	4 (4)
<b>Total</b>	<b>14 (100)</b>	<b>55 (100)</b>	<b>31 (100)</b>	<b>100 (100)</b>

Imaging studies were carried out on 54 patients and helped to reach final diagnosis in 21(38,9 %) patients.

Abdominal X-ray, which was done for 5 patients with gastrointestinal surgical problem either due to gastrointestinal anatomical abnormalities or intestinal obstruction, all show positive findings in the form of dilated loops and multiple air fluid level.

Voiding cystourethrography was done for one patient with pyelonephritis and show bilateral vesicoureteric reflux.

Barium study was done for one case having Hirschsprung's disease and show dilated colon with distal narrow segment.

Ultrasound study was done for 42 patients and show significant finding in 9(21%) of them, shown in table (5) one has finding of intestinal obstruction, one diagnosed as Wilm's Tumour, and others

medical conditions range between (gastrointestinal tract symptoms, renal problems

#### Discussion:

Vomiting is common symptom throughout childhood; a variety of causes can cause vomiting. (5)

The symptoms of vomiting and diarrhea are frequently combined during enteric infections and it is likely that on a worldwide scale is the most common cause of vomiting (3). In our study vomiting was one of early signs of presentation of infection (64%), especially gastrointestinal tract infection (23%).

Green color vomitus should bring attention of physician to a serious cause behind it (6,7) in this study a total number of 22 patients with green vomiting 11(64.7%) of them having intestinal obstruction. while God pole, et al concluded that

bilious vomiting in new born should be attributed to intestinal obstruction until prove other wise (8). The use of antiemetics may mask the features of the primary disease; delay the proper diagnosis and treatment of the disease. Adverse reactions are characteristic of dopamin receptor antagonists and include extra pyramidal dystonia (torticollis, facial spasm, trismus, oculogyric crisis), which occurs more commonly in children, and young adult (9). In our study we found that antiemetic (metoclopramide) was used for 20 (20%) patients before their admission to the hospital and two patients (10%) had oculogyric crises.

Vomiting should be approached by considering the age of the patient for the specific disease (5,6) in this study In neonates gastro intestinal tract abnormalities found to be the first cause of vomiting, 7(50%) patients out of 14, while Infections were most common cause of vomiting in infancy and childhood.

Imaging studies are indicated when the clinical findings are unclear, Ultrasound has progressively become the primary modality used to assess the acute abdomen. The lack of radiation exposure and high diagnostic efficacy of ultrasound have contributed to borden the use of ultrasound. It helps in the diagnosis of intussusception, hypertrophic pyloric stenosis, midgut volvulus and appendicitis (3). Ultrasound imaging is so accurate for the diagnosis of pyloric stenosis that it has essentially replaced the upper gastrointestinal series (10).

Radiological investigation of brain tumors has been revolutionized by the advent of CT; it provides precise anatomic location of tumor mass and with additional information's regarding the size, component and mass effect. Also in the diagnosis of head injuries, it obviated the need in most cases for more invasive diagnostic studies. CT and MRI are now techniques of choice for investigating most suspected lesions of brain (11).

**In conclusion:** Causes of vomiting are age related, Proper investigations rather than the use of antiemetics should be carried out to reach the proper diagnosis. Green color vomiting should make the physician suspicious of organic cause.

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