

## A Clinical Study of Vibriosis During 1999 in Al-Mansour Childrens' Teaching Hospital

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### ABSTRACT:

#### BACK GROUND:

Cholera is an acute infectious disease characterized by profuse watery diarrhea and vomiting. It is caused by *Vibrio Cholerae* O1 and O139 sero-group

#### OBJECTIVE:

To find out clinical variety of the admitted cases of Vibriosis..

#### METHODS:

Clinical features of the illness were studied , and fresh stool specimens were sent for culture. The stool is taken in seawater containers to the laboratory where further processing of the stool is done on alkaline peptone and TCBS medium.

#### RESULT:

All patients presented with diarrhea and the majority had vomiting ( 65% ) , ( 37.5%) of the patients presented with sever dehydration and no patient died during this study .

The epidemic mainly caused by Ogawa serotype (75%) , and there was different antibiotic resistance recorded especially for trimethoprim (47.5%) and tetracycline (25%) .

#### CONCLUSION:

Nearly all cases in vitro were susceptible to cefotaxime .

**KEY WORDS:** vibriosis , children, diarrhea, vomiting.

### INTRODUCTION:

Cholera is an acute diarrheal illness caused by a group of toxins produced by *Vibrio cholera* <sup>[1,2]</sup>

*V.cholera* is a motile G- ve non spore forming rods , grown in alkaline media (pH 6-10 ) with bile salts <sup>[1,3,4]</sup> *V.cholerae* O1 are classified as classic and

E1 Tor based on direct hemagglutination with chicken or sheep red blood cells and sensitivity to polymyxine B . <sup>[1,4]</sup> They are subdivided into serogroups based on somatic or O antigen ( Ogawa and Inaba )

The new strain causing epidemic ( O139 Bengal ) does not agglutinate with O1-O138 antisera <sup>[1,2,4,5]</sup> Direct person to person transmission is rare because inoculum required to cause disease is high ( $10^6$ ) , its transmitted through contaminated food and water. <sup>1,2,4,6]</sup> Vibrios are acid sensitive ;

the stomach is a formidable barrier in preventing these organisms from reaching the small bowel . They multiply in the lumen of small bowel and secrete enterotoxin, which stimulate cyclic AMP that responsible for the clinical manifestation

Clinically: after an incubation period of 6hrs-5 days , profuse painless watery diarrhea is

developed , rice water in its consistency with flecks of mucous but no blood .In sever cases may progress to sever dehydration, circulatory collapse, stupor and renal failure. Vomiting is common during the 1<sup>st</sup> 6-12hrs, low-grade fever occur in some children. <sup>[1,2,3,7]</sup> Two selective media are used for isolation of Vibrios , thiosulfate – citrate-bile sucrose ( TCBS) and tellurite –taurochlate –gelatin agar <sup>[4,8]</sup> DNA probe and PCR are being evaluated as tests of rapid diagnosis . The mainstay of treatment of cholera is fluid and electrolytes replacement . Oral rehydration solution (WHO-ORS) is treatment of choice <sup>[1,4,9]</sup> Fluid is given intravenously in sever cases , shock, obtunded child , ileus and vomiting <sup>[1,3,10]</sup>Antibiotics (Trimethoprim-sulfamethaxazole, tetracycline,erythromycine,and ampicillin of ( 3-5 days ) are useful in reducing the duration of diarrhea and total diarrhea stool . Safe water and food and proper handling of sewage are long term solution of the problem <sup>[1,2,3,4,11]</sup>

#### The aim of this study:

- 1- To find out the clinical variety of the admitted cases of vibriosis.
- 2- To identify susceptibility of the vibrios organism to different antibiotics

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### PATIENTS AND METHODS :

Once the patients were admitted to the diarrheal unit in Al-Mansour Children's teaching hospital , clinical features of the illness (diarrhea,vomiting, abdominal pain, presence or absence of the fever and the degree of dehydration) were studied , and fresh stool specimens were sent for culture for Vibrios and other bacterias.

The stool is taken in seawater containers to the laboratory where further processing of the stool is done on alkaline peptone water and TCBS medium, the growth was examined by a specific sub-strain antisera Ogawa and Inaba.

Antisera for the new strain O139 was practiced for the 1<sup>st</sup> time as well on all of the isolates .

The sensitivity of the different antibiotic was also studied including antibiotic that were used in the treatment and others not used .

### RESULT:

Forty three out of 80 patients were male and 37 patients were female. Their age ranged between 30 days-15 years.The high incidence rate of patients

occurred in the age group 13 months -5 years as shown in table (1).

Table (2) shows the clinical feature of the illness, when all patients had diarrhea (100%), among them 60 patients (75%) had rice -water stool.Fifty two patients (65%) had vomiting, 30 patients (37.5%) presented with sever dehydration, and fever was presented in 20 patients (25%).

Figure(1) shows the type of Vibrios isolated from hospitalized cases, where the major isolates were related to Ogawa sero-strain.

Table (3) shows different antibiotics studied for sensitivity but actually onle two antibiotics were used. 87.5% of patients received ampicillin and 12.5% received erythromycin.

Figure (2) shows a curve for prevalence of cholera in Iraq during 1992-2000.The peak of the curve occurs during 1999 and the nadir of the curve occurs during 1996.

The highest case fatality rate occurs during 1998 (3.5%),where as overall case fatality rate during period (1999-2000) was 1.3% as shown in table(4).

**Table 1 : Distribution of age groups of the patients by gender.**

Age group	Male no.	%	Female no.	%	Total	%
< 2 mo	1	1.25	2	2.5	3	3.75
2 – 12 mo	7	8.75	5	6.25	12	15
> 12mo – 5 yrs	19	23.75	16	20	35	43.75
> 5yrs – 10 yrs	9	11.25	10	12.5	19	23.75
> 10 – 15 yrs	7	8.75	4	5	11	13.75
Total	43	53.75	37	46.25	80	100

Male : Fmale ratio = 1.15:1

**Table 2 : Presenting features of 80 patients with vibriosis**

Presenting features	No.	%
Diarrhea	80	100
Rice water stool	60	75
Yellow – stool	20	25
Mucous with stool	10	12.5
Mild dehydration	12	15
Moderate dehydration	38	47.5
Sever dehydration	30	37.5
Vomiting	52	65
Low grade fever	20	25
Decrease urine output	38	47.5

\* Mean 38.6 +/- 0.8 C°

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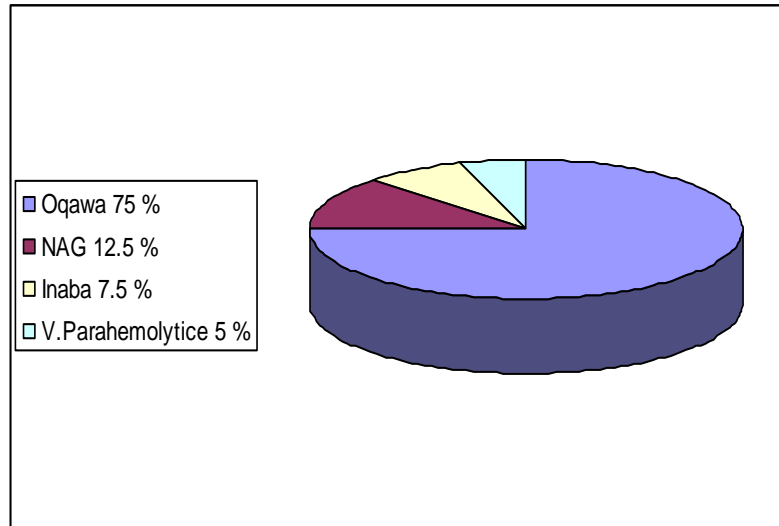


Figure (1) : Pie chart show the frequency of different serotypes of vibrio organism in culture positive cases.

Table 3 : The distribution of study sample by type of antibiotic susceptibility (No.=80)

Antibiotic used	No. of cases	% in vivo	Sensitivity in vitro	%
Ampicillen	70	87.5	74	92.5
Erythromycin	10	12.5	78	97.5
Trimethoprim	-	-	42	52.5
Tetracycline	-	-	60	75
Cefotaxim	-	-	80	100
Total	80	100	-	-

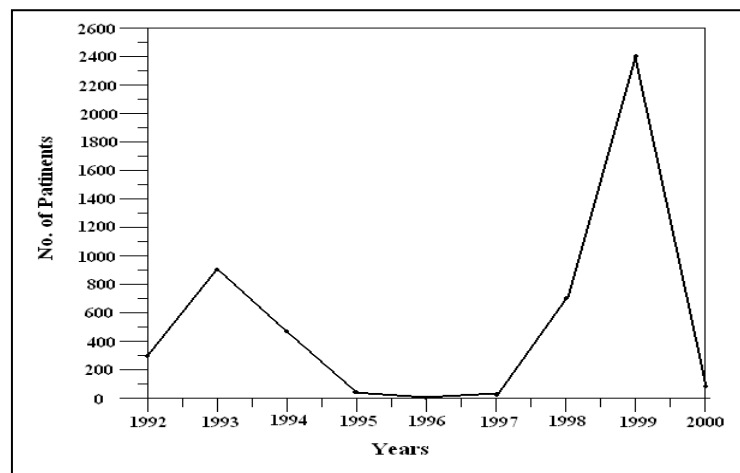


Figure (2) : Annual distribution of vibrio infection in Iraq, 1992 – 2000.

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**Table 4 : Cases fatality rates of patient with vibrio infection in iraq, 1992 – 2000**

years	No. of cases	No. of death	Case- fatality rates
1992	291	1	0.3 %
1993	877		
1994	450	3	0.6 %
1995	50	1	2 %
1996	10		
1997	20		
1998	710	25	3.5 %
1999	2429	36	1.4 %
2000	73	1	1.3 %
Total	4910	67	1.3 %

Up to 3 /10/2000

### DISCUSSION :

This clinical descriptive study showed that the epidemic which had happened during June-August 1999 was caused by different serotypes and the majority of Vibrios isolated were caused by V . cholera O1 Ogawa serotype, this result is nearly similar to four studies, were reported by EKO etal, Bioro my etal, Mahowal-Bs etal and CDC Iraq . [12,13,14,15].

Clinical syndrome induced by V.parahemolytica isolates nearly similar to V.cholera, this is similar to what was reported by Paweel –JL etal . [16]

In comparison to a similar study done in Texas in 1981 during Vibrio cholera outbreak, there was no significant difference in clinical presentation between that study and ours . [17]

Low grade fever was recorded in 20 patients, this can be explained by sever dehydration and infection with non O1 strain, EKO etal reported cholera non-O1 infection associated occasionally with low grade fever . [12]

About 37.5 % of the patients presented with sever dehydration, in comparison with two other studies, one from Bangladesh and the other from Dhaka during a cholera epidemic in 1992, the majority of cases admitted with sever dehydration (75%) and (94%) respectively [18,19] for this reason, this epidemic might be considered to be less sever , perhaps because of rapid transport of patients to seek treatment when diarrhea begins and rapidly administrated appropriate rehydration fluid .

Cholera is occasionally reported in the neonatal period , in this study , the youngest age reported is 30 days , Uppal- B etal , reported a case of Vibrio cholera O1 in a 2 days old neonate during an epidemic in India . [20]

V. cholera was isolated from all age groups , the

highest incidence was seen in children 1-5 years old age . Uppal-Betal , Beray-N etal , reported in endemic cholera usually affecting the 1-4 years old age group ,and falls thereafter , as titer of serum antibody rises and increasing immunity is acquired [4,13,20]

This study showed that the two cases isolated with multiple antibiotics resistance , both where of V. cholera non O1 serotype . However , there washigh antibiotic resistance to trimethoprim (47.5%) and tetracycline (25%) , this due to Asian strains are often resistant to trimethoprim [1,21]

Mahon etal , found in a study of V. cholerae O1 in the unit states that a proportion of isolates were resistance to at least one antibiotic rising from 3% in 1992 to 93% in 1994 [22]

The epidemic of cholera that occurred in Iraq during 1999 , might be attributed to the poor hygiene and sanitation , inadequate chlorination of water and distribution of water supply in certain area in Iraq , resulting in rapid spread of the disease . [4,15]

Low case fatality rate (1.3%) , may have been influenced by providing rehydration facilities , rapid transport of the patients to the facilities and education of the population to promptly seek treatment when diarrhea begins . W. Gray etal reported fatality rate of 1% for Vibrio gastroenteritis in Florida from 1981-1993 [8 ,23] , whereas Bioro – My etal reported high mortality rate at beginning of evry outbreak of cholera in Guinea probably due to delay in organizing appropriate care . [13]

### CONCLUSION:

The clinical presentation of diarrhea , rice water stool , vomiting and moderate- sever dehydration

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that observed in this study were the classical symptomatology of cholera.

The oral rehydration solution is life saving therapy for cholera and use of appropriate intravenous fluid result in significant reduction in mortality rate .

Most of isolates were due to Ogawa serostrain (75%) where as Inaba serotype was responsible For ( 7.5%) and remainder were related to non –O1 strains .

Significant numbers of isolated cases were resistant to trimethoprim and tetracycline and all isolates were susceptible to cefotaxime . The most effective oral antibiotic can use for Vibriosis was erythromycin .

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