

Seasonal Gastroenteritis Associated With Bacterial Species Among Iraq Children .

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Summary:

Background: Bacterial gastroenteritis is very common. It has many causes, can range from mild to severe, and usually manifests with symptoms of vomiting, diarrhea, and abdominal discomfort.

Aim of study: is to investigate the effects on gastroenteritis associated with bacterial species among children in Baghdad. Of the following variables: Season (summer and winter), Age, and sex.

Subj. & Methods: the study included 460 stool samples collected from children (227 males and 233 females) suffering from bloody ,watery, and mucoid diarrhea, with age ranger between 1-12 years ,and were attended Al- Aalwi hospital for children in Baghdad from period between May 2004 till April 2005,and stool samples were examined for bacterial pathogens .

Result : Among a total of 460 samples collected from sick children .Stool samples were examined for bacterial pathogens, more enteric pathogens were identified ,Escherichia coli (32%) ,Salmonella spp.(18%), Shigella spp.(14.8%), Clostridium spp.(8.5%), Campylobacter spp.(9.1%), Vibrio spp.(0.8%), Klepsiella spp.(4.2%), yersinia spp.(8.5%), And Aeromonas spp.(3.7%). During the summer, there was a high percentage in cases of gastroenteritis associated with bacterial species.

Conclusion: from different season showed that the highest contamination occurred in summer, infectious diarrhoea don not affect one sex more than the other does& E coli the most common isolate cause of bacterial gastroenteritis in young children.

Key Words: Gastroenteritis, Bacterial species, children

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Introduction :

Infectious gastroenteritis is a serious problem world wide as well as in Iraq causing considerable morbidity and mortality (1, 2, and 3). Although most prevalent in countries where sanitation and drinking water quality are poor food is a common means by which pathogens can infect the gastrointestinal tract ,usually as a result of contamination by an infected person during preparation (4). Lack of potable water contributed to a high incidence of diarrhoea. a large number of cases diarrhoea caused by bacterial pathogens such as E. coli, Salmonella spp., Shigella spp., Campylobacter spp., Viberio cholera, yersinia spp., and ales (5). The bacteria are excreting through fasces, and spread through contaminated food or water, often by vegetables, water red by sewage (6). May effect the incidence of infectious disease around the world through it is regional effects on weather. The incidence of bacterial diarrhoea generally raises in summer, for example, salmonella and campylobacter infections increase in summer (7, 8). **The aim:** was to study patients with gastroenteritis were attended Al-Aalwi hospital for children , It based on the analysis of stool from patients to determine the etiologic agents of gastroenteritis disease, and find out the effect of sex , age, and season on it .

Patient And Method:

A. patient: children who had acute gastroenteritis and residing in Al-aalwi hospital for children for period from may 2004 till April 2005. The patient were admitted to the hospital, performed a physical examination and assessed the clinical signs, administered to an adult guardian questionnaire Regarding demographic background, medical history (table 1). A stool specimen collected immediately after admission was use for etiological studies. The study populations include (460) children, (227) males and (233) females.

B.Collection of samples: Samples (460) were in the form of faecal specimens collected from sick children each sample was collected by a sterile swab, then Dipped in thiol broth (difco) containing charcoal, then transported directly to the laboratory of the hospital.

C. microbiological examination: Stool samples were culture for bacterial pathogens, the samples were plate on maCconky agar (MA), Blood agar, S-S agar, and other media, see table-2 (10, 11). Almost all of the specimens were investigate for bacterial pathogens. Identified and characterized using classical presumptive method according to Bergy's Manual (12). In addition, isolates were test as described in (12, 14) see table 2.

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Result:

table1 . Stool characteristics and no. (%) of hospitalized patient

Stool characteristics		no. (%) of hospitalized patient
stool consistency	watery	323 (70.3)
	mucoid	69 (15)
	bloody	46 (10)
	loose	105 (23.3)
clinical symptoms	vomiting	161(35.3)
	fever	230 (50)
	abdominal pain	138 (30)
dehydration status	sever	184 (40)
	moderate	230 (50)
	none	23 (5)
duration of diarrhea before admission to the hospital	up to 24h	345 (75)
	>24 to 48h	46 (10)
	> 48h	23 (5)

table -2. detection method and biochemical identification of species

organism	detection method	microbiological characteristics
<i>Escherichia coli</i>	MacConkey, Eosin-methylene blue	G-rod, lactose-producing
<i>Salmonella spp</i>	Blood agar, S-S agar Eosin-methylene blue	Non lactose , non-H ₂ S producing G- Rods
<i>Shigella spp</i>	Blood , S-S agar	Non lactose , H ₂ S producing G- Rods
<i>Klebsiella spp</i>	Blood agar , MacConkey agar.	G- NON-motile capsulated rods
<i>Vibrio cholera</i>	Blood agar, TCBS agar	oxidase-positive, motile, curved G-Bacilli
<i>Aeromonas</i>	Blood agar,	oxidase-positive, flagellated G-Bacilli
<i>Clostridium spp</i>	Latex agg.	Anaerobic, spore-forming G+ rods.
<i>Yersinia</i>	Blood agar, MacConkey agar.	G-NON-motile, capsulated coccobacilli positive catalase test, negative oxidase test
<i>Campylobacter</i>	Skirrow agar , blood agar	G- spiral curved rods Positive catalase test and oxidase test.

Table- 3-No. (%) of bacterial isolates during the summer months (from May to September) and winter months (from December to April) for period between May 2004 till April 2005.

organism	no. (%) of isolate during the winter				no. (%) of isolate during the summer			
	male	female	less than 2 year	more than 2 year	male	female	less than 2 year	more than 2 year
<i>Escherichia coli</i>	23(34)	29 (39.7)	52(66.6)	0(0.0)	29(29)	31(27.9)	60(63.1)	0(0.0)
<i>Campylobacter</i>	1(1.5)	2 (2.7)	0(0.0)	3(4.9)	15(15)	14(12.6)	4(4.2)	25(21.5)
<i>Salmonella spp</i>	11(16.6)	10 (13.6)	8(10.2)	13(21.3)	20(20)	22(19.8)	8(8.4)	34(29.3)
<i>Shigella spp</i>	8(12.1)	9 (12.3)	7(8.9)	10(16.3)	16(16)	19(17.1)	9(9.4)	26(22.4)
<i>clostridium spp</i>	4(6.0)	7 (9.5)	5(6.4)	6(9.8)	7(7)	12(10.8)	9(9.4)	10(8.6)
<i>Yersinia</i>	14(21.2)	11(15)	5(6.4)	20(32.7)	2(2)	3(2.7)	1(1)	4(3.4)
<i>Klebsiella spp</i>	3(4.5)	5(6.8)	1(1.2)	7(11.4)	3(3)	4(3.6)	1(1)	6(5.1)
<i>Aeromonas</i>	2(3.0)	0(0.0)	0(0.0)	2(3.2)	6(6)	5(4.5)	3(3.1)	8(6.8)
<i>Vibrio cholera</i>	0(0.0)	0(0.0)	0(0.0)	0(0.0)	2(2)	1(0.9)	0(0.0)	3(2.5)

Discussion:

The interest in the gastroenteritis associated bacterial species seemed to have been stimulate by that description in (1987) of the (21).

About (76.3 %) of cases (diarrhoea) were positive for bacterial growth, but no pathogens are identified in (23.6 %) of stool samples the negative result refers to another cause of diarrhoea Like viral gastroenteritis, which is, considers one of most important causes of diarrhoea (13, 14), which is more common in winter. The cause of diarrhoea depends on geographic, sanitation, water supply and season.

Escherichia coli The most common isolated pathogen (32 %) from children with diarrhoea were Admitted to the hospital followed by *Salmonella* spp. (18 %), *Shigella* spp. (14.8 %), *Campylobacter* spp. (9.1 %), *Yersinia* spp. and *Clostridium* spp.(8.5 %), *Klepsiella* spp. (4.2 %) *Aeromonas* spp. (3.7%), and *Vebrio cholera* (0.8 %). Pathogenic strain can cause gastroenteritis by use several mechanisms to cause symptoms Invasive bacteria cause mucosal ulceration and abscess formation (15) bacterial toxins control enteral and extra enteral cellular processes, for example ,the heat-labile and heat-stable enterotoxins of *Escherichia coli* activate enteral adenylate cyclase and guanylate cyclase (16) Verotoxin that enterohemorrhagic *E. coli* and *Shigella* spp., produce causes systemic disorder. other non invasive bacteria adhere to the gut wall, causing inflammation organisms such as *E. Coli* and *Clostridium* spp.. (17,18).

We have shown that a larger proportion of gastroenteritis associated bacterial species during the summer (60.2%) compared with the winter (39.7%). The high percentage of bacterial isolates in the summer season explained by the fact that seasonal increase in fly populations results from an increase in temperature that causes the development from egg to fly to occur in days rather than months .individual flies can lay hundreds of eggs ,which can result in a large increase in fly numbers in a short period fly numbers fluctuate through the summer and decline in winter , disease transmission is hypothesized to occur through small quantities of contaminated material carried on the feet, proboscis ,legs and body of flies that have been in contact with faces (9). and high temperatures favorite the growth of *E. coli* ,*Salmonella* spp., And similar species in the water which is a major reservoir for many organisms that cause diarrhea (19), Swimming pool have been associated with outbreak of *Shigella* organisms and *Aeromonas* , and this result approximately the same result in Jun. 2003 estimated 50 percent of the water in Iraq is not safe to drink and temperature in July and August can soar to 45C, water and food borne diseases that were endemic to Iraq are growing to epidemic

proportion ,and Iraq heading for summer of diarrhoea (20).

Escherichia coli, *campylobacter* spp, *Salmonella* spp., *Shigella* spp. are the top four leading causes of bacterial diarrhoea in summer(see table 3) followed closely by *Clostridium yersinia* infection occurs most frequently in winter months. In the present study most cases gastroenteritis do not affect one sex more than the other. It was similar to that described by Ikram 2002 (22).

Conclusion: During the summer, there was a high percentage in cases of gastroenteritis associated with bacterial species. *Escherichia coli*, *Salmonella* spp. *Shigella* spp. *campylobacter* spp, are the top four leading causes of bacterial gastroenteritis in summer followed closely by *Clostridium* spp. , *yersinia* infection occurs most frequently in winter months. Most infectious gastroenteritis does not affect one sex more than the other does. The most common isolate cause of bacterial gastroenteritis in young children *E coli*.

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