Clinical Study Of Enteropathogenic Which Causes Diarrhea Among 0-15 Years Age Group In Baghdad City

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Abstract

Diarrheal diseases are a leading cause of mortality among children in developing countries. This study is designed to investigate the bacterial, viral and parasitic etiology and related clinical and epidemiological factors in children among 0-15years age group with diarrhea in Baghdad city. A total of 200 sample of the stool obtained from children with diarrhea visiting child's Central Teaching Hospital and Alkadhmiya Hospital for children in the period between April , 2016 to October , 2016 . Stool sample were examined by using standard culture and identification methods for bacteria , and by microscopically using normal saline and iodine staining wet mounts for identification of parasites and by Rapid Diagnostic Kit for detection of rotavirus. From summation of 200 cases in the study group ,144(72%) infected by single etiology and 56(28%) infected by mixed etiology . The highest infection rate recorded in the bacterial group (51.5%) followed by parasitic group (37.5%) and viral group (11%) . According to the age categories , it was observed that maximum bacterial infection rate at age group (< 1 years) were (46%), while at age group (> 5 years) were (52%) for maximum parasitic infection and viral infection recorded the highest rate in the age group (1-5 years) by 73% . The result of the study showed that the predominant bacteria were *Escherichia coli* with 20.5% followed by *Shigella sp.* , *Salmonella sp.* and *Klebsiella sp.* with 14.5% , 10% and 6.5% respectively . *Entamoeba histolytica* recorded highest parasitic infection rate 19.5% followed by *Giardia lamblia* 12.5% and *Blantidium coli* 5.5% . The percentage of samples infected with rotavirus was 11% compared with the total number of samples studied .

Introduction

Diarrheal disease is defined as having three or more loose or liquid stools per day or more frequently than normal for that person (1). Diarrhea is leading cause of childhood morbidity and mortality in the developing

countries , especially in areas with poor disinfection , lake of safe drinking water and inadequate sanitation (2) . Various etiological agents , including viruses , bacteria , protozoa and helminthes , cause diarrhea . These organisms are transmitted from the stool of one individual to the mouth of another , a route termed feacal – oral transmission . However , they differ in the exact route of entry from stool to mouth and in the infectious dose needed to cause the disease (3) .

The bacterial species implicated include serotypes of *Escherichia coli* , *Shigella sp.* , *Salmonella sp.* , *Vibrio cholera* , *Compylobacter jejuni* , *Staphylococcus sp.* , *Citrobacter sp.* etc (4) . *Giardia lamblia* , *Entamoeba histolytica* , *Iodomoeba bullshili* are some of protozoa implicated . Fungal enteritis has also been documented (5) . Rotavirus is the most common pathogen witch causes gastroenteritis in developing countries (6) . An epidemiologic study of an infective disease in a community is always considered to be an initial step to the introduction of the appropriate interferences for controlling the disease because the feature and the patterns of isolation of pathological causes of the disease vary from place to place depending on the local geography , metrology and socio – economic elements (7) .

This study was carried because , diarrhea and associated of droughts state remain the major problem to the public health importance in the medial east especially in the age under 5 years old . The purpose is to study the various causative factors of diarrheal disease and diagnosis the effect result of it in children under 15 years old .

Materials an Methods

A total of 200 sample of the stool were collected from children between 0-15 years of age visiting child's central Teaching Hospital and Alkadhmiya Hospital for children in the period between April , 2016 to October , 2016 .

Data collected by mean of study questionnaires . Fresh stool specimens was collected from the patient in to a sterile container and examined microscopically for cysts and trophozoites of parasites , using normal saline and iodine staining wet mounts (8) .

Standard culture and identification methods were used for bacterial investigation (9,10) . For rotavirus , stool samples were analyzed using Rota Rapid Diagnostic kit as described by manufacturer (Diaspot company, Indonesia) .

Results and Discussion

Out of 200 cases in the study group , 72% showed single etiology and 28% mixed etiology Table (1) . Similar observation were made by (11) . As

they found 25% cases of mixed infection . Figure (1) shows that the highest infection rate recorded in the bacterial group (51.5 %) followed by parasitic group (37.5%) and viral group (11%) . Similar observation were made by *Saeed etal* ., 2015 which found that the prevalence of diarrhea caused by bacteria was significantly higher than that caused by parasitic and virus infection (12) .

Distribution of etiological agent according to the age categories shown in Table (2) , it was observed that maximum bacterial infection rate at age group (< 1 years) were (46%) and Lowest percentage appeared at age group (> 5 years) were (20%). As for parasitic infections , the most age group susceptible to infection were (> 5 years) at percentage (52%) and lowest (< 1 years) at percentage (19%) . Viral infections recorded the highest infection rate in the age group (1-5 years) by (73%) and the lowest rate in the age group (> 5 years) by (9%) . A similar pattern of age distribution has been found in earlier done studies (13,14) . Children of less than 5 years has been identified as the most infection with diarrhea and equally dire consequences. The cause of infection in large age is that these children are more free , active and active in school and outside the home , while not respecting the health conditions (15) .

Table (3) shows the number of days in which the case of diarrhea continued through it is possible to determine whether the infection with diarrhea is acute or chronic . In bacterial infections , most cases were characterized by chronic diarrhea with 49% and 19% of children with diarrhea for 1-2 days . As for parasitic infections , the proportions are almost equal to 40% for continued cases of diarrhea 1-2 days and 38% more than 4 days . while most cases of diarrhea for viral infections were acute diarrhea of (59%) and (32%) of children with diarrhea for 1-2 days .

These results show that most bacterial cases were in the chronic diarrhea stages . Parasitic infections were half of the cases with severe diarrhea and the other half suffered from chronic diarrhea . While viral infections were in the stages of acute diarrhea . These results correspond to a study conducted by (16,17) .

Distribution of different epidemiological factors are shown by table(4) . The rate of the diarrhea was higher in male children (58) than in female children (42) , as reported in many previous studies by (18,19) . In other study by (20) found that male and female children were equally affected . The type of breast feeding was studied in the cases of diarrhea in infants , with the highest incidence of diarrhea in infants who rely on artificial feeding (73%) , while the lowest percentage of infection in infants who rely on breast feeding (27%) . On the basis of drinking water , the

highest infections rate among children . Who rely on tap water (71.5%) compared to a sterile water (28.5%) . No previous results were recorded against this study in terms of reliance on artificial feeding and drinking from tap water which had the highest incidence of diarrhea in children . In a study accompanied by (21) , tap water recorded the highest rate of infection with diarrhea (51.1%) , as well as the type of artificial feeding (55.3%) .This study showed that diarrhea is more common in children living in rural setup (60.5%)than the one living the urban setup(39.5).This can be ascribed to poor quality of disinfected condition and sanitation practices in rural population contributes high risk of infection especially among children (22).

Table(5)showed that *E.coli* was recorded as the predominant bacteria with (20.5)0f prevalence followed by *Shigella sp,Salmonella sp* and *Klebsiella* with (10%),(14.5%)and (60.5%) respectively. This pattern was similar to other study done by(23) . *Entamoeba histolytica* recorded highest infection rate(19.5%)followed by *G.lamblia* and *B.coli* with(12.5%)and (5.5%)respectively. Similar observation were made by(24,25).The percentage of sample infected with the rotavirus was(11%)compared with the total number of sample studied. This result was similar to the finding of the studies done by(26,27).

Determination of diarrhea etiology and improved hygiene are important for clinical management and controlled strategic planning to reduce the burden of the preventable infectious diseases among children.

Table (1) : Single and mixed pathogens identified in stool sample from diarrheal cases .

Etiology	**No. of cases**	**Percentage (%)**
Single pathogen	144	72
Mixed pathogen	56	28
Total	200	100

Table (2) : The percentage of etiological agent according to the age Categories .

Etiology	**< 1 years(%)**	**1-5years(%)**	**>5 years(%)**	**Total(%)**
Bacteria	47(46)	35(34)	21(20)	103(100)
parasite	14(19)	22(29)	39(52)	75(100)
Virus	4(18)	16(73)	2(9)	22(100)
Total	65(32.5)	74(37)	61(30.5)	200(100)

Table (3) : The percentage of the etiological agent according to the duration of the time for continuation of diarrheal cases .

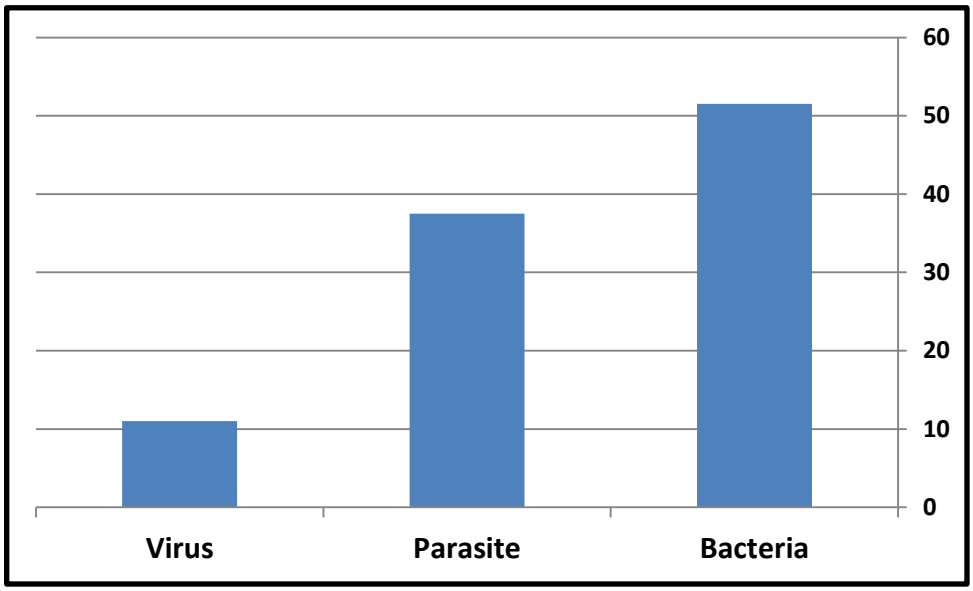
Etiology	1-2Day(%)	3-4Days(%)	>4Days(%)	Total(%)
Bacteria	20(19)	33(32)	50(49)	103(100)
Parasite	30 (40)	17(23)	28(37)	75(100)
Rotavirus	13(59)	7(32)	2(9)	22(100)
Total	63(31.5)	57(28.5)	80(40)	200(100)

Table(4): Distribution of different epidemiological factors among the children offered with diarrhea.

Epidemiological Factors		N=200 No(%)
Sex	Male	116(58)
	Female	84(42)
Feeding	Artificial Feeding	146(73)
	Breast Feeding	54(27)
Water source	Tap Water	143(71.5)
	Sterile Water	57(28.5)
Residence	Rural	121(60.5)
	Urban	79(39.50)

Table(5): Prevalence of various etiological agent in diarrhea patients.

Etiology	Number(%)
Bacteria	
Escherichia coli	41(20.5)
Salmonella sp.	20(10)
Shigella sp.	29(14.5)
Klebsiella sp.	13(6.5)
Parasite	
Entamoeba histolytica	39(19.5)
Giardia lamblia	25(12.5)
Blantidium coli	11(5.5)
Virus	
Rotavirus	22(11)
Total	200(100)



Figure(1): The percentage of the etiological agents causing diarrhea .

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الخلاصة

تعد امراض الاسهال سببا رئيسيا للوفيات بين الاطفال في البلدان النامية. صممت هذه الدراسة لتحديد المسببات البكتيرية والفيروسية والطفيلية والعوامل السريرية والوبائية لدى الاطفال الذين تتراوح اعمارهم بين0 – 15 سنة والذين يعانون من الاسهال في مدينة بغداد. تم جمع 200عينة براز من الاطفال المصابين بالإسهال خلال مراجعتهم مستشفى الطفل المركزي التعليمي ومستشفى الكاظمية للأطفال للفترة ما بين نيسان 2016 الى تشرين الاول 2016. شخصت البكتريا المعزولة باستخدام الطرق التشخيصية والزرعية القياسية . وبالفحص المجهري تم تشخيص الطفيليات باستخدام المحلول الملحي الفسيولوجي والشرائح الرطبة المصبغة باليود اما الفيروس العجيلي الدوار فتم الكشف عنه بواسطة عدة التشخيص السريع. من مجموع 200 عينة براز شخصت144 عينة مخمجة بنوع واحد من المسببات المرضية بنسبة 72% و 56 عينة تحوي اخماج مشتركة بنسبة28% . ان اعلى نسبة خمج كانت للمجموعة البكتيرية (51.5%) تليها المجموعة الطفيلية (37.5%) والمجموعة الفيروسية(11%). وفقا للفئات العمرية المدروسة لوحظ ان اعلى نسبة للاخماج البكتيرية كانت عند الفئات العمرية اقل من سنة واحدة بنسبة (46%) بينما سجلت الاخماج الطفيلية اعلى نسبة خمج عند الفئة العمرية اكثر من 5سنوات بنسبة (52%) اما الاخماج الفيروسية فقد كانت الفئة العمرية 1–5 سنوات اكثر عرضة للخمج وبنسبة (73%) . اظهرت نتائج الدراسة ان البكتريا السائدة هي *Escherichia coli* بنسبة 20.5% تليها *Shigella sp.* , *Salmonella sp.* و *Klebsiella sp.* بنسبة 14.5% ، 10%, 6.5% على التوالي . سجلت *Entamoeba histolytica* اعلى معدل للاخماج الطفيلية (19.5%) تليها *Giardia lamblia* (12.5%)و *Blantidium coli* (5.5%) وكانت النسبة المئوية للعينات المصابة بالفايروس العجيلي الدوار 11% مقارنة مع مجموع العينات التي تمت دراستها .