

Survey study of Bacterial & Parasitic diarrhea in children under five year In Al-kufa (Barakia)

دراسة مسحية لنسب الإصابة بالأسهال البكتيري والطفيلي عند الأطفال دون سن الخامسة في قضاء الكوفة (منطقة البراكيا)

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Abstract :

This survey study was carried out in the primary health care center of Muslim Ibn Akeel in al-Kufa town(Barakia) –Al –Najaf Al- ashraf governorate district to survey the risk of contaminated water and prophylactic measures for diarrhea (during 2005 and 2006) with (40254 population and the number of children under 5 years approximately 6600 child). In 2005 there were 340 children under 5 year suffering from diarrhea, but in 2006 there is a clear increase 670 cases. (Archive of PHC of Muslim Ibn Akeel) This work proposes to study some suggestions to reduce pediatric diarrhea in a low-income area by using filtration tools and new method for water sterilization (water pasteurization) and participation of organizations of civilization society for a large area with poor water, food hygiene, and sanitation are common in communities with high levels of diarrhea. Underlying conditions, such as malnutrition, which modify the risk of contracting diarrhea, are also common in such regions. These factors combine to facilitate the spread of enteropathogen including demographic, Precoded questionnaires with demographic details, clinical history, and physical signs were completed. 60 samples of water for chlorine test were negative and samples of stools that collected for routinely general stool examination there were showing high rates of G. lamblia, Ent.Histolytica, E. coli, motile monilia, motile bacteria, H.nana & others. Cultures of water samples were showed growth of E.coli on selective media such as (Mackonky agar).

الخلاصة :

هذه الدراسة المسحية نُفذت في مركز الرعاية الصحية الأولية لمسلم ابن عقيل في الكوفة (منطقة البراكيا) محافظة النجف الأشرف لمسح خطر الماء الملوث والإجراءات الوقائية من الإسهال (خلال عامي 2005 و2006) , لمنطقة يبلغ عدد سكانها (40254) نسمة وعدد الأطفال تحت 5 سنوات تقريباً (6600 طفل). في 2005 كان هناك (340) طفل تحت 5 سنة عانوا من الإسهال، لكن في 2006 ارتفع إلى (670) حالة وهذا يوضح زيادة واضحة في عدد الإصابات. (أرشيف المركز). اقترح هذا العمل دراسة بعض الاقتراحات لتخفيض إسهال الأطفال في منطقة ذات دخل واطئ باستعمال أدوات ترشيح الماء والطريقة الجديدة لتعقيم الماء (بسترة الماء) وإشراك منظمات المجتمع المدني لمنطقة كبيرة تعاني من شح عدم نظافة الماء، الغذاء، و سوء تصريف المجاري و ذات مستويات عالية من الإسهال. الشروط التحتية، مثل سوء التغذية، الذي يعدل خطر تقلص الإسهال، هو شائع أيضاً في مثل هذه المناطق إن تجمعت هذه العوامل يسهل انتشار الإسهال. أعدت استمارة الاستفتاء التي تتضمن التفاصيل السكانية، التاريخ السريري، ومؤشرات طبيعية قد أكملت. 60 عينة من الماء فحصت لاختبار الكلور و كانت سلبية وعينات الغائط التي جمعت لفحص الخروج العام الروتيني أظهرت نسب عالية من جيارديا lamblia، الانتيميا Histolytica، الاشرشيا القولونية، فطريات و بكتيريا متحركة، إتش. نانا و مسببات مرضية أخرى. زرع عينات الماء أظهرت نمو الاشرشيا القولونية على الأوساط الزرعية الانتقائية مثل (وسط ماکونکی المثلثة).

Introduction:

Diarrhea is the passage of watery stools, usually at least three times in a 24 hour period. However, it is the consistency of the stools rather than the number that is most important. (1), and an increase in stool weight more than 200 g/ day (2) Acute diarrhea remains a leading cause of morbidity and mortality (3) in children all over the world especially in developing countries and causes 4% of all deaths and 5% of health loss to disability (4). In Rwanda crisis in 1994, outbreaks of diarrhea resulted from contaminated water with different microorganisms caused at least 48000 cases and 23800 deaths within one month in the refugee camps in Goma, the Congo. (5), it is one of the three biggest killers of children less than 5 years are newborn disorders, pneumonia and

diarrhea. (6) Diarrhea and respiratory infections are the first and second of most common cause of illness and death among children under 5 years old (7) Fifteen million children each year affected with diarrhea episode (8) A child under 5 in the early 1990s suffered from an average of about 4 episodes of diarrhea per year, by 1996-1997, we found that children were getting about 14 episodes of diarrhea in a year. (9) In Southeast Asia and Africa, diarrhea is responsible for as much as 8.5% and 7.7% of all deaths respectively (10) and between 21 and 37 million episodes of diarrhea occurs annually. (11) The mortality rates in the south and center of Iraq for children under 5 years of age had more than doubled that in north. For instance mortality rate had increased to 131 deaths per 1,000 live births which puts Iraq on the same plane as Haiti or Pakistan .Infant mortality rates were 108 deaths per 1,000 live births, which means in practical terms one in 10 children do not survive beyond their first birthday (12) The mortality rate has increased by a staggering 150 percent since 1990. Some 122,000 Iraqi children died in 2005 before reaching their fifth birthday. (13) Poor hygiene, lack of clean drinking water is the main causes of diarrhea, and it is a major killer. In 1998, bacterial & parasitic diarrhea was estimated to have killed 2.2 million people, most of whom were under 5 years of age. Each year there are approximately 4 billion cases of diarrhea worldwide (14) While other says about 3.2 million child deaths annually (15) There are 30 controlled studies were compared data, randomized or "quasi-randomized," of interventions to improve the microbiological quality of drinking water in settings where diarrhea is endemic, mostly in poor and developing nations. The studies involved more than 53,000 people (16). In Iraq malnutrition rates are roughly double of those a year ago (UNICEF), roughly 70% of children recently seen by a Canadian medical team were suffering from diarrhea, cholera or typhoid .The UNICEF confirmed diarrhea, mainly due to unsafe water, causes 70% of children's deaths in Iraq because the amount of raw sewage being dumped into water supplies has roughly doubled (from 500,000 tons per day to 1 million tons per day) (17). The most serious issue is diarrhea from water contamination, which proves fatal in many cases. Over 50% of the country's water supply is contaminated because the infrastructure and water purification system were destroyed (18). *E. coli*, *G. lamblia* & *Enta. Histolytica*) and other are causes of diarrhea in areas of endemicity include a wide variety of bacteria, parasites and protozoa. (19) In Al-Najaf governorate *E. coli* is the most common bacterial cause of diarrhea in children (20).*Escherichia coli* (*E. coli*), is one of the main species of bacteria living in the lower intestines of mammals, known as gut flora discovered in 1885 by Theodor Escherichia (21). Thus, treatments which kill all active bacteria, such as pasteurization or simple boiling, are effective for their eradication, without requiring the more rigorous sterilization which also deactivates spores. As a result of their adaptation to mammalian intestines, *E. coli* grows best in vivo or at the higher temperatures characteristic of such an environment, rather than the cooler temperatures found in soil and other environments. (21) *E.coli* is also an indicator organism of contaminated or unsafe water (22) Most *E. coli* infections is spread through contaminated food or water, such as undercooked food or unwashed fruit that came into contact with animal manure. *E. coli* infections, which usually affect kids during their first few years of life, also can be spread via contaminated swimming water and petting zoos (23). The primary cause of diarrhea is contaminated drinking water. 2.5 billion incidents of illness are caused by contaminated water every year. 50% of hospitalizations in developing countries result from water-borne disease. The World Health Organization predicts that by 2025, the number of people without access to safe drinking water will increase to more than 2 billion Safe water can be brought to the 1.4 billion people around the world ,which can prevent 3.35 billion cases of illness and 5.3 million deaths caused each year by unsafe water(24).

Materials and methods:

Patients were children under 5 years with bacterial & parasitic acute diarrhea, defined by the passing of three or more loose or watery stools in the 24-h period prior to presentation. In the same time we examined samples of water had taken from different sources (tap water, river, and tank) to determine the percentage of chlorine in it also water for culture to determine growth of micro-

organisms and general stool examination to determine existence of pathogenic factors. Laboratory technicians were not given any clinical information, and all samples were processed as follows.

(i)Chlorine test; samples of water were collected from different sources and examined by DPD (diethyl paraphenylene diamine), which is the quickest and simplest method for chlorine residual in water, were negative (25). (ii) Bacteriological studies; Culture of water samples were collected from different sources and places of area (26) (iii) Routinely general stool examination; Fresh specimens of stool were examined directly for micro-organisms.

Results:

Table (1) reveals that the number of negative and positive cases of stool examination according to years in children under than 5 years in Al- Kufa (Barakia)

Year	No of negative cases and their percentage	No of positive cases and their percentage	Total number of diarrhea cases
2005	68 (20%)	272 (80%)	340
2006	67 (10%)	603 (90%)	670

Table (2) reveals that the number of positive cases and their percentage according to the type of micro-organisms in 2005

Diarrhea causes	G.Lamblia	Ent. histolytica	E.coli	Monilia& bacteria	H.nana	Others	Total
Number & their percentage	96(35.3%)	62(22.8%)	20(7.4%)	80(29%)	8(2.9%)	6(2.2%)	272(100%)

Table (3) reveals that the number of positive cases and their percentage according to the type of micro-organisms in 2006

Diarrhea causes	G.Lamblia	Ent. histolytica	E .coli	Monilia& bacteria	H.nana	Others	Total
Number & their percentage	209(34.7%)	152(25.2%)	85(14%)	131(21.7%)	13 (2.2%)	13(2.2%)	603(100%)

All 60 collected samples of water that tested were negative for chlorine, normal chlorine residual is 0.5-2.0 parts per million. From 340 cases of diarrhea in 2005 were 68 (20%) cases with normal flora, 272 (80%) of stool samples that examined were showed G. lamblia 96 (35.3%) Enta. histolytica 62 (22.8%), motile monilia 80(29%) E coli 85 (14%), motile bacteria, H.nana and other micro-organism, but in 2006 only 67 (10%) cases were with normal flora and 603 (90%) of routinely stool examination showing G. lamblia 209(34.7%), Enta. histolytica 152 (25.2%), motile monolia, motile bacteria 131(21.7%), coli 85(14%), H .nana 13 (21.7%). and other micro-organism. Ninety percent of water samples in 2005 that cultured were showed growth of E. coli, also in 2006 all samples were showing growth of E coli.

Discussion :

Because the absence of all samples of water from chlorine which is killing of harmful organisms and decrease of chlorine leads to growth of pathogenic microorganism as a G. lamblia, Enta. Histolytica, motile bacteria, motile monolia E.coli and other micro-organisms in water causing

diarrhea,(27) rural areas primarily receive their drinking water through piped systems which are not chlorinated. Sources of drinking water are from pipes (some of it are broken), rivers and tanks. Rural households primarily have flush toilets which are attached to sewage systems while the large majority of rural households use free flow latrines (small out-house but hole is less than 1 meter deep and it is drained by letting feces run out of the back of the outhouse into the open ground) Some pathogens are often found in water, frequently as a result of fecal matter from sewage discharges, leaking septic tanks, runoff from animal feedlots into bodies of water (28) .Overall; most persons do not purify their water in their house by adding chlorine or by boiling. Only few families of households add chlorine or boil their water before drinking it. These purification processes are most prevalent in the rural destroyed areas and the study showed that the samples of the water were absent of chlorine that means the benefits of chlorine are absent, which they are; reduces many disagreeable tastes and odors; eliminates slime bacteria, molds and algae that commonly grow in water supply reservoirs, on the walls of water mains and in storage tanks; removes chemical compounds that have unpleasant tastes and hinder disinfection; and helps remove iron and manganese from raw water (29) Culture of water from different sources were showed approximately 90% growth of pathogen E. coli colonies, which is a certain indicator of transmission of E.coli to GIT and causing diarrhea. General stool examination of samples in 2005 showed that G .lamblia, Entamoeba. histolytic, E.coli, motile bacteria, motile monilia and other micro-organisms which are caused diarrhea, but general stool examination of samples in 2006 showed increase incidence of positive cases and decrease negative cases.Children who need more fluids in relation to body weight than older children and adults are particularly vulnerable to health hazards caused by water pollution (30) Adults need half as much water as infants - depending on the amount of exercise, heat loss, illness, food, safe water and electricity have yet to be restored to pre-war levels. (31) ,that means amount of E.coli and other micro-organisms entering GIT in children (1-3) years is more than in adults which lead to appearance of diarrhea in children more than in adults it is also an indicator organism of contaminated or unsafe water (22).

Conclusions:

Majorities of the sources of water and food in the area are contaminated with E.coli and other micro-organisms which consider the main causes of diarrhea especially in the children under 5 year age because the absent of chlorine and its benefits

Recommendations :

- 1-Boil the water.
- 2-Use available water filtration tools found in our markets, in especially that have antibacterial character (with ultra violet lamp).
- 3- Use the SolSaver (device) which is a solar water pasteurizer that eliminates disease-causing, water-borne parasites. It kills 99.999% of them, according to tests conducted at the University of Hawaii's Water Resources Research Center and uses in Africa and India. The SolSaver pasteurizes up to 1000 or more liters (250 gallons) of water per day (31)
- 4-Participation of organizations of civilization society in Iraq in resolve the problem by bringing tools of water filtration , filtrated water, health education and others.

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