

## **Adherence to WHO guidelines of diarrhea management among children under 2 years old in Tikrit city**

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### **Abstract**

Diarrhea, has a major impact on global health, due to its high worldwide prevalence and health costs, and because it can be reduced by appropriate interventions and treatment. The aim of this study is to evaluate the adherence of health workers with the WHO guidelines of diarrhea management for children under 2 years old. A cross sectional study, done in 4 primary health care centers and Tikrit Teaching hospital . Three samples tested ; Random sample of 491 mother of under 2 years old child with diarrhea, 14 GP and 17 nursing staff in PHCCs, 22 residents and 11 nursing staff in Tikrit teaching hospital. Drugs alone or with ORS had given by 90% of all respondents and non-had received ORS alone. About 45.5% of the residents and 21.4% of GP prescribe antispasmodic and antiemetic drugs during diarrhea. Only one 4.5% of the residents know that zinc is used in the treatment of diarrhea, and only 21.4% of the GP and 9.1% of the residents know the relation between vitamin A and diarrhea. Only 14.3% of the GPs and 9.1% of the residents didn't use antibiotics in the management of diarrhea. Only 14.3% of the GPs and 13.6% of residents give correct indication of antibiotic use in diarrhea. Only 70.3% of the PHCC nursing staff and 18.2% of hospital nursing staff mentioned dextrolyt as the best treatment for diarrhea. Conclusion: There is overuse of antibiotics which is due to the wrong knowledge of the health workers.

***Keywords: practices of health workers, CDD, diarrhea, under 2 years old children.***

## Introduction

Diarrhea is a major health problem, a major cause of death, and the impact is greatest in developing countries. Diarrhea distributed throughout the country and its rate are higher in summer than in winter<sup>[1]</sup>. Studies in Iraq showed that diarrhea prevalence was much higher in children aged 6-23 months<sup>[1]</sup>. It's responsible for about one out four deaths among infants under 1 year old and it is number one killer among children in 1995. Diarrhea incidence in under 5 years old children was nearly 15 episodes per child per year in 1996 and the case fatality rate from diarrhea was about 1.7%<sup>[1, 2]</sup>. Diarrhea has no significant sex, or residence differences. The peak of prevalence occur in the weaning period among children aged 6-11 months (36.7 %)<sup>[3]</sup>. Inappropriate management and prescription of medications by health workers is common in developed<sup>[4]</sup> and developing countries<sup>[5]</sup>. Over prescription and abuse of antibiotics in the treatment of diarrhea<sup>[6]</sup> is a worldwide problem, potentially leading to widespread antibiotic resistance. The aim of this study is to evaluate the adherence of health workers with the WHO guidelines of diarrhea management for children under 2 years old.

## Subjects and methods

A descriptive cross sectional study conducted in 4 primary health care centers (PHCCs), and Tikrit Teaching Hospital. The study consists of three parts: mothers, doctors and nursing staff. A convenient sample of 491 mothers of children less than 2 years with diarrhea (before 2 weeks to avoid recall bias) and attended these two foci, during the period of the study (6 month) in a randomly selected (lottery) 4 days a week. All health workers in PHCCs and in pediatric ward in Tikrit

Teaching Hospital were interviewed, 22 residents and 11 nursing staff in Tikrit teaching hospital, 14 GP, and 17 nursing staff in PHCCs. **Inclusion criteria:** Nursing staff were working in the WHO programs (CDD, ARI, Vaccination) only included. The GPs of PHCCs and the residents who trained in the pediatric ward for at least one month were included. A small-scale pilot study was carried out on a sample of 30 mothers, all mothers, doctors and nursing staff were interviewed using a 3 standard questionnaires prepared by the researcher, separately with complete privacy, so that the answers are less likely to be affected by hearing the answers of others. The 1st questionnaire was developed for the mothers, second for the doctors and the third for the health workers. Statistical Analysis and handling of data done by use of Epi-Info (version 6.02) software<sup>[7]</sup>. The nature of the association studies by application of statistical tests to measure the association by help of Chi square. P value of  $\leq 0.05$  was regarded as statistically significant.

## Results

Drugs alone or with ORS had given by 442 (90%) of all respondents and non-had received ORS alone. Oral drugs given by 366 (74.5%) of mothers, and 53 (10.8%) received herbal medicine (sagua). ORS used by only 185 (37.7%) of mothers, 123 (45.4%) of them were urban mothers in comparison with 62 (28.2%) rural mothers. Home fluid was used by 264 (53.8%) mothers, 179 (66.1%) of them were urban mothers. About 49 (9.9%) children not received any type of treatment and the most commonly mentioned cause was teething 35 (71.5%). This relation was statistically significant as shown in table 1. Among the 185 mothers who had used ORS

solution, 140 (75.7%) mentioned that their children didn't accept it . According for that 83 (59.3%) stopped giving it, 31 (22.1%) tried to give it with sips, 14 (10%) fasting the child from water, feed, & breast feeding, 7 (5%) Add milk or juice (fresh or commercial) & bicarbonate beverages, 3 (2.1%) Dilute with water and 2 (1.5%) Add sugar to the ORS solution to make it more acceptable. This relation was statistically not significant as shown in table 2. Use of antispasmodic and antiemetic, 10 (45.5%) of the residents and 3 (21.4%) of GP prescribe these drugs during diarrhea, this relation not significant statistically(  $X^2= 4.94, p>0.05$ ), as shown in Figure.1 Only one (4.5%) of the residents know that zinc is used in the treatment of diarrhea, and only 3 (21.4%) of the GP and 2 (9.1%) of the residents know the relation between vitamin A and diarrhea. Only 2 (14.3%) of the GPs and 2 (9.1%) of the residents didn't use antibiotics in the management of diarrhea. Cotrimoxazole used by 12 (85.7%) of the GPs, 3 (13.6%) of the residents. Metronidazole used by 9 (64.3%) of the GPs and 8 (36.4%) of

the residents. Ampicillin used by 12 (54.4%) of the residents and 2 (14.3%) of the GPs, this relation is statistically significant (  $X^2= 15.74, p<0.05$ ), as shown in (Table 3.). Only 2 (14.3%) of the GPs and 3 (13.6%) of residents gave both indication of dysentery and suspected cholera. This relation is statistically significant (  $X^2= 14.02, p<0.05$ ), as shown in (Table 4.). When the nursing staff asked about the best treatment for diarrhea, 12 (70.3%) of the PHCC nursing staff and 2 (18.2%) of hospital nursing staff mentioned dextrolyt. Antibiotics mentioned by 8 (75.7%) of hospital nursing staff and 10 (58.8%) of the PHCC nursing staff, this relation is statistically not significant (  $X^2= 7.02, p>0.05$ ), as shown in (Table 5.). Dysentery was mentioned by 2 (11.8%) of PHCC nursing staff and none of the hospital nursing staff as indication for antibiotic use in diarrhea, but none of both groups mentioned suspected cholera. The most common wrong indication was severe gastroenteritis mentioned by 8 (72.8%) of the hospital nursing staff and 11 (64.7%) of PHCC nursing staff as shown in Table 6.

**Table (1):- Treatment given to the child by the mother during the last episode of diarrhea.**

Treatment	Urban denominator=271 no.(%)	Rural denominator=220 no.(%)	Total denominator=491 no. (%)
Syrup or pill	203 (74.9)	163 (74.1)	366 (74.5)
Home fluid	179 (66.1)	115 (52.3)	264 (53.8)
ORS <sup>c</sup>	123 (45.4)	062 (28.2)	185 (37.7)
Injection <sup>a</sup>	083 (30.6)	079 (35.9)	162 (32.9)
IVF <sup>b</sup>	016 (5.9)	047 (21.4)	063 (12.8)
Herbal medicine	013 (4.8)	040 (18.2)	053 (10.8)
Nothing	030 (11.1)	019 (8.6)	049 (9.9)

$X^2= 44.06, p<0.05$  significant

a-medical treatment as intramuscular injections. b-intravenous fluid. c-oral rehydration solution

Table (2):- Practice of mothers if child not took ORS.

Mother action	Urban denominator=95 no. (%)	rural denominator=45 no. (%)	Total denominator=140 no. (%)
Stop treatment	60 (63. 2)	23 (51.1)	83 (59. 3)
Give with sips	21 (22. 1)	10 (22. 2)	31 (22.1)
Fasting of the child	06 (6.3)	08 (17.7)	14 (10)
Add sugar	02 (2.1)	00 (0)	02 (1.5)
Dilute with water	01 (1)	02 (4.4)	03 (2.1)
Add milk /juice	05 (5. 3)	02 (4.4)	07 (5)

$X^2 = 4.94, p > 0.05$  not significant

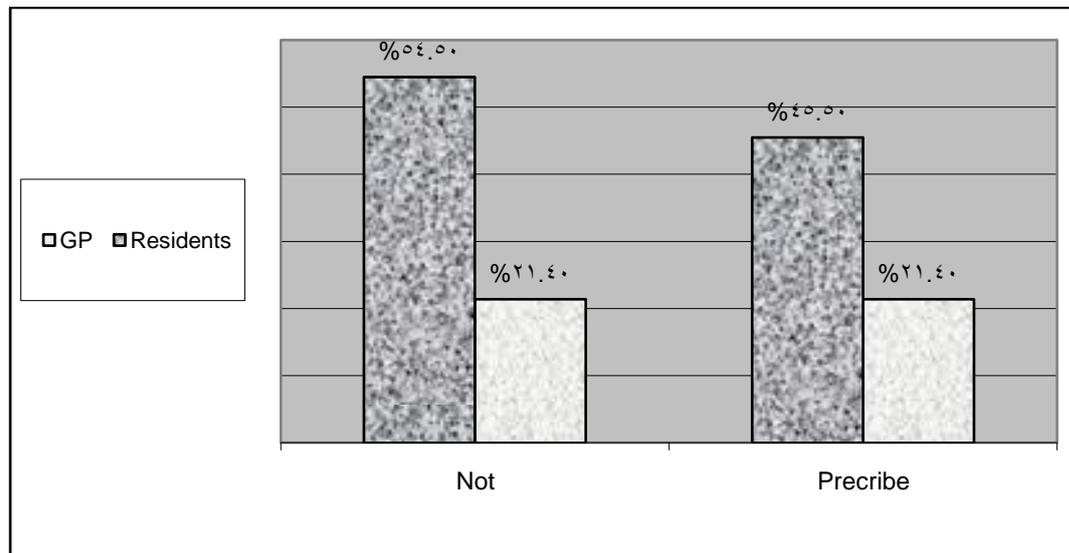


Figure (1):-Use of antispasmodic and antiemetic drugs by doctors

Table (3):- Type of antibiotics used by doctors.

Antibiotics	GP no. (%)	Residents no. (%)
Metronidazole	9 (64.3)	8 (36.4)
Cotrimoxazole	12 (85.7)	3 (13.6)
Ampicillin	2 (14.3)	12 (54.4)
3 <sup>rd</sup> generation cephalosporin	5 (35.7)	11 (50)
Gentamycine	2 (14.3)	6 (27.3)

**Table (4):- Indication of antibiotic during diarrhea by doctors**

Indication	GP no.(%)	Residents no. (%)
Dysentery	2 (14.3)	20 (90.9)
Cholera	2 (14.3)	3 (13.6)
Bacterial cause	6 (42.8)	8 (36.4)
Chronic diarrhea	4 (28.6)	10 (45.5)
Severe Gastroenteritis	9 (64.3)	4 (18.2)
Diarrhea with fit	2 (14.3)	5 (22.7)
Malnourished	3 (21.4)	4 (18.2)

**Table (5):- Best treatment for diarrheaby nursing staff**

Best treatment	Hospital nursing staff (%)	Hospital nursing staff (%)
Antibiotics	8 (75.7)	10 (58.8)
Dextrolyt	2 (18.2)	12 (70.3)
Antispasmodic & antiemetic	0 (0)	2 (11.8)
Breast feeding	5 (45.5)	4 (23.5)
Home fluid	2 (18.2)	0 (0)
Intravenous fluid	3 (27.3)	2 (11.8)

**Table (6):- Indication of antibiotic during acute diarrheaby nursing staff**

Indication of antibiotic	Hospital nursing staff No. (%)	Hospital nursing staff No(%)
Dysentery	0 (0)	2 (11.8)
Cholera	0 (0)	0 (0)
Severe Gastroenteritis	8 (72.8)	11 (64.7)
persistent diarrhea	4 (36.4)	6 (35.3)
Don't know	0 (0)	3 (17.6)

## **Discussion**

The quality of management of diarrhea depends on a variety of factors, such as health workers' knowledge, case management skills, motivation, supervision, and the provision of necessary supplies and essential drugs, and laboratory facilities<sup>[8]</sup>. The results indicate that none of mothers use ORS alone, this was with accordance with AL-Kadhimi G A.<sup>[9]</sup>, this may be due to that mothers believe that ORT alone cannot cure diarrhea<sup>[10]</sup>. Drugs were used in most of the cases, which goes in accordance with Chowdhury AM<sup>[11]</sup>, who found that 85% of diarrheal cases given treatment, but it's higher than what found by AL-Kadhimi G A who found that 76% received drugs, most of which were antibiotics and antidiarrheal drugs, and Ezat W. 30.8% in Baghdad<sup>[9,12]</sup>. This problem is also present in other countries, e.g Thailand 2004<sup>[13]</sup>. This may be explained by what found by Al-Jurayyan et al 1994<sup>[14]</sup> in Saudi Arabia, and Desjeux et al.<sup>[15]</sup> who found that the use of ORT is associated with drugs because of; first, the great diversity of therapeutic approach: families could decide alternately to come to the hospital or the clinic, to use traditional medicines or visit a private practitioner to provide health care, the physician were therefore in a competitive situation. Second, the physician couldn't ascertain their diagnosis without laboratory tests but these tests were not always possible because of their cost or due to great geographical distance, and third cause were that private physicians, and even those in the public sector would base their biomedical treatment of diarrhea on the prescription of five or six drugs; antidiarrheal, antiemetic, antipyretic, often associated with antibiotics, and sometimes ORS<sup>[15]</sup>. Rural children receive intravenous fluid more than urban children, this may be due to that

they are more likely to be presented with severe dehydration as a result of deficient knowledge and practice. The homemade fluids and ,ORS use rate during last episode of diarrhea, was lower than Ezat W.<sup>[12]</sup> found 74.4% use homemade fluids and 55.3% of mothers use ORS. Urban mothers are more habitat in use of homemade fluids and ORS and this agreed with Ezat W. who found urban mothers are more habitat in use of homemade fluids (70.6%) and ORS (60.3%)<sup>[12]</sup>. The low rate of ORS use may be explained by what found by the medical anthropological studies that ORS acceptance tend to be limited because, people prefer antidiarrheal medicines, which have palliative effects , such as hardening the stool or stopping the diarrhea<sup>[16]</sup>, according to some families and the mother didn't see end of diarrhea<sup>[16, 15]</sup>. Herbal medicine was used by noticeable percent of mothers, rural mothers were more habitat in its use than urban mothers. These results may be less than the truth because of denial, as a result of fear of blaming and judicial punishment, and this goes in accordance with what found by Abu Hijleh, who found that 13.3% use herbal medicine<sup>[17]</sup>. These results can be explained by what found by Briand S. et al, that mother think diarrhea is due to a supernatural cause, she immediately goes to traditional practitioner<sup>[18]</sup>. Only 1:10 of children not received any type of treatment, and the most commonly mentioned cause was teething, this can be dangerous if the caregiver assume that teething children who had diarrhea undergoing a normal phase of development and no special treatment is needed. Children at this age tend to start weaning and thus loss the protection of breast milk, they also may be exposed to food born germs. It might be more useful to teach mothers

to give ORS to prevent dehydration when child had diarrhea regardless of its cause<sup>[19]</sup>. Three quarters of mothers that used ORS in last episode of diarrhea mentioned that their children not took it, which is higher than 60.5% that found by Ghada<sup>[9]</sup>. About 10% of mothers use fasting of the child from all fluids and semisolid food to force him to take ORS. This may be explained by maternal ignorance of the method of mixing ORS packets and preparing a solution which might be too concentrated, it was often noted that the packets of salt was powdered into the baby's bottle all at one time and not given tea spoon by tea spoon for a long period<sup>[12,15]</sup>. As recommended by WHO the drugs though commonly used, have no practical benefit and never indicated for the treatment of acute diarrhea in children<sup>[20]</sup>. In this study about 21.4% of GPs and 45.5% of residents use antispasmodic and antiemetic drugs during diarrhea, this figure goes in accordance with what found by Okeke TA et al<sup>[21]</sup>, 41% of physician used it. This can be explained by the physician believes that use of spasmolytic decrease bowel movements, relief abdominal pain and satisfy the parents. In this study a large percentage of the GPs and residents didn't know the relation between the diarrhea and vitamin A and between diarrhea and zinc and its use in diarrhea, while, vitamin A and zinc deficiency is widespread among children in developing countries<sup>[20,22]</sup>. It has been shown that zinc play critical roles in metallo-enzymes, polyribosomes, cell membrane and cellular function, leading to the believes that it also plays a central role in cellular growth and in function of the immune system<sup>[20]</sup>. For the above results we discover that our physicians need to update their information. There's a noticeable percent of the physicians mentioned

antibiotics use in the management of diarrhea 14.3 % of GPs and 9.1% of the residents, and there believes will affect the management of acute diarrheal cases. More than half of the PHCC nursing staff and 3/4 of the hospital nursing staff mentioned it as the best treatment of a diarrhea case, while the CDD program depend on the nursing staff in ORS giving in the ORT corners. A great gap between the health workers knowledge and practice was found in the results of management of under 2 years in the last episode. This is with accordance with health facility survey Iraq, is really available, it was not adequately used due to the lack of training courses skepticism of both physicians and mothers about its value, especially when compared with demand for drugs<sup>[23]</sup>. This result goes in accordance with Salazar Lendo E et al<sup>[24]</sup> who found that physicians prescribe antibiotics to 85.7% of inpatient and 50% of outpatient diarrheal cases. This may be due to that parents complain of ORS is not a medicine to stop diarrhea, and if a physician gives ORS only, then parents change to a doctor who will prescribe drugs. Physicians who recommended drugs are getting more businesses<sup>[25]</sup>. It is tempting to think that diarrhea is caused by infection, therefore it should be treated by antibiotics, but antibiotics are reliably helpful only for children with bloody diarrhea, suspected cholera with severe dehydration, and serious non intestinal infections such as pneumonia<sup>[25,20]</sup>. The most common drug used by GPs was cotrimoxazol 85.7% This result was in accordance with what found by Howteerakul N in Thailand in the year 2004<sup>[13]</sup>. Metronidazol used by GPs more than the residents, this may be explained that in the outpatient there's more preference to oral antibiotics and every bloody diarrhea

may be given Metronidazol while the WHO recommendation was to treat bloody diarrhea with ciprofloxacin or with another oral antimicrobial, as metronidazol is ineffective for treatment of *Shigella*<sup>[20]</sup>. Metronidazol should be considered only when microscopic examination reveals *E. histolytica*<sup>[20]</sup>. There is great defect in knowledge regarding indications of using antibiotic for diarrhea treatment among all health workers, these results go in accordance with Barros EC et al.<sup>[26]</sup> who found that more than 2/3 of health professionals gave wrong indications for use of antibiotics. Severe gastroenteritis and persistent diarrhea was mentioned by many of the GPs, residents, hospital nursing staff, and PHCC nursing staff. This means that the overuse of antibiotics is due to these wrong indications mentioned by health workers, in another word if any case of severe gastroenteritis given antibiotics, so high percentage of cases will be given antibiotics.

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