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Knowledge, Acceptance and Practice of Zinc Therapy in Acute Diarrhoea Among Paediatric Doctors in Nigeria

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Abstract *Background:* WHO and UNICEF recommend zinc therapy in children with acute diarrhoea, however adherence to the recommendation varies from country to country.
Objectives: To determine the knowledge, acceptance and practice of zinc use in childhood diarrhoea among paediatric doctors in Nigeria.
Methods: Every third sitting participant during the 42nd Paediatric Association of Nigeria Conference was requested to complete a questionnaire if they were either a paediatric resident doctor or consultant working in Nigeria.
Results: Of the 153 questionnaires distributed, 93 (60.8%) were returned and 85 met the study criteria. Over half (57.6%) of the respondents were consultant paediatricians and 84.7% (49 of 85) practise in tertiary or teaching hospitals, mostly in the southern part of Nigeria (70.8%). About half (44.3%) of the respondents managed more than 10 diarrhoeal cases every month. All except one respondent (84 of 85) agreed with the WHO/UNICEF recommendation and 86.9% (73 of 85) reported prescribing zinc for acute diarrhoea in the past year; 67.1% (49 out of 73) prescribed it always for acute diarrhoea. Knowledge of the effects of zinc on acute diarrhoea was high. There was no significant difference between the paediatric residents and the consultants in both knowledge and practice of zinc therapy.
Conclusion: The use of zinc as an adjunct in the management of acute diarrhoea is acceptable and practised by most paediatric residents and consultants in Nigeria.

Key Words: acute diarrhoea, knowledge, practice, WHO, zinc

Introduction

Diarrhoea remains a leading cause of mortality and morbidity in the paediatric population globally, and also in Nigeria.[1,2] Most diarrhoeal deaths result from dehydration and take place at home or soon after arrival at the hospital. To combat this trend, WHO recommended the use of oral rehydration solutionincluding continued oral feeding. Based on the reports of several studies[3-6] confirming the beneficial effects of zinc therapy in acute watery diarrhoea, the WHO and UNICEF, in 2004, recommended its use for 10-14 days in children with acute diarrhoea.[7] Since the publication of the recommendations, many countries have developed guidelines on the management of acute diarrhoea which include zinc[8] However, it has been observed that that adherence to treatment guidelines for the management of common childhood illnesses such as diarrhoea is low worldwide.[8-10] In Sudan,Cheragil*et al*[11] noted that the adherence of prescribers to standard treatment guidelines for treating diarrhoea in the public hospitals ranged between 45-64%. Similarly, arecent study in India found that only 22% of 843 prescriptions for acute diarrhoea included zinc.[9]

There appears to be little published information available on the use or prescription of this vital

Supplement for children with diarrhoea by paediatricians in Nigeria. Thus this study aims to describe the knowledge and practice of the use of zinc in the treatment of acute watery diarrhoea by paediatric residents and consultants in the country.

Materials and Methods

The study was carried out during the 42nd Annual Paediatric Association of Nigeria Conference (PANCONF), held in Abuja, Nigeria between 12th and 14th January 2011. PANCONF is the largest annual gathering of paediatricians, paediatric residents and other health practitioners in the practice of child health in Nigeria. It attracted over 500 participants from Nigeria and the rest of the world. A sample size of 158 was calculated using the Cochran's formula with correction for finite population and a reported adherence of 75% from a previous study.[12-13] To increase the geographical spread of the survey and diversity of the participants, every third sitting participant was recruited, because participants that share the same interests and location of practice tend to sit togetherduring meetings.

The questionnaire included sections on the demographics of the respondents such as gender, time since medical school graduation and fellowship in paediatrics, practice type and location; number of diarrhoea cases seen per month; agreement with the WHO guidelines on the use of zinc for acute watery diarrhoea; zinc prescription pattern; and knowledge about the function of zinc in acute diarrhoea. To encourage completion, each question except the ones on time since graduation or fellowship and practice location had 3 or more options to choose from. To maximize retrieval, the questionnaires were distributed on the first day of the conference. Only questionnaires from resident doctors in paediatrics and consultant paediatricians were analyzed. Incompletely filled questionnaires or questionnairesfilled byparticipantspractising outside Nigeria were excluded

The data was entered into Microsoft Excel 2007 and analyzed using EPI info version 3.4.3. One of the authors checked the entered data for errors by going through all the questionnaires again. For theknowledge-based section on the benefits of zinc In diarrhoea where the options provided were 'Yes', 'No' and 'Not sure', if none of the options was ticked it was assumed the respondent was not sure of the correct answer. Continuous variables were tested for normality and presented as mean (SD) or median (IQR) as appropriate. Categorical variables were presented as percentages. Test of differences in the knowledge and practice of the residents and the consultants was compared using odds ratio. The level of statistical significance was set at 5%.

Results

Of the 153 questionnaires distributed 93 were returned (60.8%). Eight questionnaires were discarded because they were completed by nurses (3), did not include the state where practice is located (3), did not see any child with diarrhoea in the past one year (1) and was incompletely filled (1); leaving 85 questionnaires for analysis. The median time since graduation from medical school was 13 years and 45 (52.9%) of the respondents were females. Most of the respondents work in tertiary or teaching hospitals (84.7%) located in the southern region of Nigeria (70.8%). Consultants made up 57.6% (49 out of 85) of the respondents with a median time since attainment of fellowship of 4 years. About half (44.3%) of the respondents attend to more than 10 diarrhoeal cases every months Table 1.

All the respondents except one (84 out of 85) agreed with the WHO recommendation that zinc should be given to children with acute diarrhoea and 86.9% (73 out of 85) prescribed zinc for acute watery diarrhoea in the past 1 year. Of those who prescribed zinc in the past one year, 67.1% (49 out of 73) prescribed it all the time they managed a child with acute diarrhoea Table 2. Of the 88 respondents who agreed with the WHO recommendation,more than 75% responded that zinc in acute watery diarrhoea should be given for 10-14 days, that it reduces diarrhoea duration, replaces body stores of zinc and re-epithelizes the intestine. A smaller proportion (60.7%) agrees that it reduces stool frequency. In contrast, less than half (45.2%) reported that zinc reduces stool volume. There was no significant difference in the knowledge and practice of paediatric residents and consultants concerning zinc use in acute diarrhoea (Tables 2 and 3).

Table 1: Description of the studied population

Descriptors	All n=85 (%)	Residents n=36 (%)	Consultants n=49 (%)
Gender			
Males	40 (47.1)	15 (41.7)	25 (51.0)
Females	45 (52.9)	21 (58.3)	24 (49.0)
Time since medical school graduation, median(IQR), years	13 (12)	8 (4.5)	17 (11)
Time since fellowship, median (IQR), years	NA	NA	4 (8)
Practice location:			
North-west	13 (14.6)	9 (25.0)	4 (8.2)
North-central	9 (10.1)	2 (5.6)	7 (14.3)
North-east	1 (1.1)	1 (2.8)	0 (0.0)
South-west	24 (27.0)	7 (19.4)	17 (34.7)
South-south	19 (22.5)	12 (33.3)	7 (14.3)
South-east	19 (21.3)	5 (13.9)	14 (28.6)
Practice Type:			
General hospitals	8 (9.4)	3 (8.3)	5 (10.2)
Tertiary/Teaching Hospitals	72 (84.7)	32 (88.9)	40 (81.6)
Private/NGOs	5 (5.9)	1 (2.8)	4 (8.2)
Diarrhoea cases/month:			
1-10	49 (55.7)	19 (52.8)	30 (61.2)
11-20	20 (23.9)	10 (27.8)	10 (20.4)
>20	16 (20.5)	7 (19.4)	9 (18.4)

19.NA: not appropriate

Table 2: Practice of zinc use in acute watery diarrhoea

Practice Variables*	All n (%)	Residents n (%)	Consultants n (%)	Odds Ratio	P value
Agrees with WHO				0.00	0.58
recommendation	84 (98.9)	36 (100.0)	48 (98.0)		
Yes	1 (1.1)	0 (0.0)	1 (2.0)		
No					
Teach student use of Zinc				1.09 (0.30-	0.57
Yes	67 (85.9)	29 (85.3)	38 (86.4)	3.93)	
No	11 (14.1)	5 (14.7)	6 (13.6)		
Prescribed zinc in the past				1.03 (0.25-	0.62
year	73 (86.9)	32 (88.9)	41 (85.4)	4.13)	
Yes	9 (10.7)	4 (11.1)	5 (10.4)		
No					
How often is zinc prescribed				1.47 (0.54-	0.45
All the times	49 (67.1)	23 (71.9)	26 (63.4)	4.00)	
Rarely/Sometimes	24 (32.9)	9 (28.1)	15 (36.6)		
Duration zinc is prescribed				2.05 (0.49-	0.26
(days)	10 (13.7)	3 (9.4)	7 (17.1)	8.67)	
5	62 (84.9)	29 (90.6)	33 (80.5)		
10-14					

*The total respondents for each practice variables differs

Table 3: Knowledge of the Function of Zinc in Acute Diarrhoea

Knowledge Variables*	All n (%)	Residents n (%)	Consultants n (%)	Odds Ratio 95%CI	P value
Does zinc reduce stool volume				1.06 (0.44-2.52)	0.90
Yes	38 (45.2)	16 (44.4)	22 (45.8)		
No/not sure	46 (54.8)	20 (55.6)	26 (54.2)		
Does zinc reduce diarrhoea duration				1.24 (0.43-3.61)	0.70
Yes	67 (79.8)	28 (77.8)	39 (81.3)		
No/not sure	17 (20.2)	8 (22.2)	9 (18.8)		
Does zinc reduce stool frequency				0.79 (0.33-1.93	0.61
Yes	51 (60.7)	23 (63.9)	28 (58.3)		
Not/not sure	33 (39.3)	13 (36.1)	20 (41.7)		
Does zinc re-epithelize the intestine				0.53 (0.12-2.22	0.30
Yes	74 (88.1)	33 (91.7)	41 (85.4)		
Not/not sure	10 (11.9)	3 (8.3)	7 (14.6)		
Does zinc replace body store				1.27 (0.45-3.54)	0.65
Yes	65 (77.4)	27 (75.0)	38 (79.2)		
Not/not sure	19 (22.6)	9 (25.0)	10 (20.8)		

*knowledge variables for the 84 respondents who agree with the WHO/UNICEF recommendation

Discussion

In this study an attempt was made to determine, using self-report, the level of adherence to the WHO-UNICEF recommendation concerning the use of zinc in acute diarrhoea. All but one of the participating respondents agreed with the recommendation with over 80% prescribing zinc for acute diarrhoea in the past year. Of those who prescribed zinc in the past one year, two-thirds prescribed it all the time they managed a child with acute diarrhoea. The high practice rate in this study is similar to the findings of two retrospective studies in India which reported that 65% of the children with acute diarrhoea received a prescription of zinc.[13] Inontrast, the prescription rate in the present study is much higher than the 22% reported by Pathak*et al*[9] in another region in India.

The higher rate in the present study compared to that of Pathak *et al* may be due to several factors. While the study by Pathak*et al* involved mostly general practitioners the present study involved paediatricians and paediatric residents whose knowledge of the current management of diarrhoea is expected to be higher. Secondly, the huge difference in adherence rates to the WHO recommendation could also be due to the methods used to access adherence. As expected, adherence measure by actual observation is commonly found to be lower than adherence inferred from self report.[14] With widespread awareness of a recommendation among health workers, adherence is expected to increase[13]; hence the difference in study periods could also have contributed to the varied adherence rates.

The high prescription rate for zinc in the present study may be explained by the demographics of the respondents. All the respondents were either specialist paediatricians or paediatric residents practicing in tertiary or teaching hospitals with a median duration since graduation from medical schools of 13 years. Because most of the respondents indicated that they teach students about diarrhoea, it is expected that they were more likely to be current in the knowledge and practice of common childhood medical conditions compared to general practitioners. The small number of respondents in facilities other than teaching/tertiary hospital did not allow for comparison in the present study. Moreover, since about half of the respondents manage more than 10 cases of acute diarrhoea per month, it is likely that this would have contributed to their knowledge and practice of the standard management of acute diarrhoea.

The majority of the respondents reported that prescribing zinc in acute diarrhoea was associated with shorter diarrhoea duration, fewer stool frequency and helps in the re-epithelization of the

Intestinal mucosa. The high proportion of the respondents with the correct knowledge of the effects of zinc on the course of acute diarrhoea may have contributed to the high zinc prescription rate (elicited by self-report) documented in the present study. In contrast, less than half of the respondents reported that zinc use leads to reduction in stool volume. This low response may be due to the conflicting findings from various studies on the effect of zinc on stool volume.[15-17]

In agreement with the WHO recommendation, the vast majority of the respondents in the present study reported prescribing zinc for 10-14 days to children with acute diarrhoea; about 14%, most of whom are consultant paediatricians, prescribed zinc for 5 days. Plausible explanation for the practice of zinc prescription for 5 days was not explored in the study but may be due to reports of studies supporting than zinc therapy for less than 10-14 days was equally effective.[3,18] For instance, in a randomized community trial in Bangladesh a 5-day regimen was not different from a 10-day regimen when the primary outcome was incidence and duration of diarrhoea over the subsequent 90 days.[18]

In terms of knowledge and practice of zinc use in acute diarrhoea, there was no significant difference between the resident doctors and consultant paediatricians. This finding is not unexpected for several reasons. Being a fairly common childhood condition both the residents and consultants would have had ample opportunities to participate in the management of acute diarrhoea and as a result improve knowledge and practice. Also, as most of the respondents are from teaching/tertiary hospitals they are exposed regularly to academic activities that provide opportunities to update knowledge and practice of common health conditions including diarrhoea.

The 42nd PANCONF provided a unique opportunity to determine knowledge and practice of zinc use, not only in one centre or region, but among paediatric doctors from all the regions of Nigeria. Our findings support a country-wide practice of the prescription of zinc during a bout of acute diarrhoea in children, although the north east region was sparsely represented in the sample. The result of the present study implies acceptance of the recommendations of WHO and UNICEF concerning the use of zinc in acute diarrhoea to most members of the Paediatric Association of Nigeria. Like in most countries where the recommendations have been implemented, support by paediatric associations has been important to the implementation.[8]

The findings of the present study may not be extrapolated to the general population of paediatric doctors in Nigeria, because the respondents may be a selection bias of doctors that are abreast with current medical practice.The lower sample size may also have reduced the generalizability of our findings. However the conference provided an opportunity to improve response rate and coverage to a country-wide study. For unknown reason(s) respondents from the north east region of Nigeria were poorly represented in the study. However we are not aware of any reason why their acceptance and practice of zinc use in acute diarrhoea should be significantly different from the results of the present study. Because the questionnaire with the instruction 'for doctors only' was handed to every third sitting participant, some of whom may not be medical doctors, the response rate in this study could be higher than the 60% response rate recorded. We were not able to comment on the demographics of those who did not return the questionnaires.

Conclusion

The use of zinc in the management of acute diarrhoea is acceptable and practiced by most paediatricians and paediatric resident doctors in Nigeria, most of whom posses the correct knowledge about the effects of zinc on the clinical course of a bout of acute diarrhoea.

Author's contribution: ECI and AOF conceived the study but all the authors participated in the design and implementation of the study. In addition all the authors approved the submitted manuscript.
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