

Original Research Article

Facility-based evaluation of under-fives with diarrhoea in Cross River State, Nigeria: a clinical audit

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Received: 25 June 2016

Accepted: 05 August 2016

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ABSTRACT

Background: Diarrhoea is the second leading cause of under-five mortality globally. Proper evaluation of children with diarrhoea is important for making right diagnosis, instituting appropriate treatment and invariably reducing - related childhood deaths. This study was undertaken to determine the extent under five with diarrhoea diseases were evaluated by health workers prior to commencement of treatment.

Methods: A clinical audit was conducted from May to June 2013 in 32 health facilities in the Southern region of Cross River State, Nigeria. Trained field workers extracted information related to patient evaluation from case records of under-fives treated diarrhoea diseases for using a validated audit tool.

Results: Case records of 370 under-five children treated for diarrhoea diseases were retrieved and audited. The duration of diarrhoea was reported in 242 (65.4%), stool consistency in 189 (51.1%) and vomiting in 177(47.8%). Other relevant information in the history was reported in less than 45%. Information on risk factors for diarrhoea was reported in less than 40%, assessment for skin turgor in 201 (54.3%) while other physical examination findings were reported in less than 25% of the case records. Request for laboratory investigations were recorded in about 10%.

Conclusions: The evaluation of under-five with diarrhoea by health workers prior to initiation of treatment was sub optimum. Patients' evaluation declined steadily from the stage of history taking, to physical examination, and laboratory investigation.

Keywords: Clinical audit, Diarrhoea, Evaluation, Health facilities, Under five

INTRODUCTION

Diarrhoeal disease is a major contributor to under five morbidity and mortality globally.¹ The disease is most prevalent in Africa and Asia where poor personal hygiene, food handling practices and environmental sanitation are identified predisposing factors for microbial contamination of foods and drinks.²

Rota virus and enterotoxigenic *Escherichia coli* are the most frequently implicated microbial agents in childhood diarrhoea.³ These agents act on the intestinal wall,

leading to a series of chemical reactions that induce secretion of copious fluid from the intestinal wall into the intestinal lumen that is eventually passed as diarrhoea stool. The clinical presentation of childhood diarrhoea depends on the volume of fluid loss in the stool, the presence or absence of comorbidities, diarrhoea related complications and the nature of treatment received either at home or in the health facilities.⁴

Childhood diarrhoea is a preventable and treatable disease. The recommended strategies for preventing childhood diarrhoea are exclusive breastfeeding for the

first six months of life, access to safe drinking water, hand washing with soap, improved personal and environmental hygiene, food hygiene and rota virus vaccination. Adhering to these cost effective preventive strategies is very important for diarrhoea control especially in developing countries.^{5,6}

Most cases of diarrhoeal illnesses in Nigeria are managed in health facilities. Adequate evaluation of children with diarrhoea disease by health workers can lead to identification of risk factors associated with an episode of the illness which will form the basis for educating caregivers on diarrhoea preventive measures.

An understanding of these preventive measures and having caregivers to observe them has the potential of reducing the likelihood of repeated episodes of diarrhoeal illness in the children.⁷ In addition to the above, adequate patient evaluation increases the chances of making accurate diagnosis, instituting accurate treatment and invariably reducing childhood diarrhoea related morbidity and mortality.

Unfortunately, not all health workers take time to adequately evaluate their patients prior to initiation of treatment.⁸ This is especially true in very busy practices in developing countries.

Consequently, several workshops to downstream the WHO standard treatment guidelines for diarrhoea case management in under five children have been conducted among health workers in the state. To reduce diarrhoea morbidity and mortality in developing countries, it is necessary to determine the extent to which health workers adhere to the WHO treatment guidelines in the evaluation of under-five children with diarrhoea.

METHODS

A clinical audit of case management of acute diarrhoea in health facilities in Southern Cross River State, Nigeria, was conducted between May and June 2013.

The study was conducted in the southern senatorial district of Cross River State. Calabar is the administrative headquarters of Cross River State, one of the 36 political administrative states in Nigeria. It is located in the south eastern axis of Nigeria. The state is in the tropical rain forest belt with an annual rainfall of over 3500 millimetres.⁹

Primary and secondary health facilities in Calabar municipality and Calabar South Local Government Areas of Cross River State were assessed for this audit. Health facilities were classified as either primary or secondary based on the level of health care services offered. For this audit, primary health centres were categorized as primary health facilities while private and general hospitals were categorized as secondary health facilities.

The target population for this audit was under-fives managed for acute diarrhoea episodes in the study facilities in the 3-6 months prior to data collection.

The LGAs in the southern senatorial districts were listed and two (Calabar municipality and Calabar South) were selected by balloting. Simple random sampling was used to select twelve primary health facilities and five secondary health facilities (one General and four private hospitals) from Calabar municipality and nine primary health facilities and five secondary facilities (one General and four private hospitals) from Calabar South LGA. In each of the selected health facilities, the case records of at least 10 under-fives managed for acute diarrhoea disease 3-6 months before the study were randomly selected and evaluated.

An audit tool using key evaluation indicators for childhood diarrhoea was developed. The tool was pre-tested and validated using case records of under-fives treated for diarrhoea in the University of Calabar Teaching Hospital. Health workers (medical doctors, nurses and a medical laboratory scientist) were trained on data extraction from patients' case records.

Data extraction

Information extracted on patient's evaluation were age, sex, temperature, weight, history of the diarrhoeal illness, risk factors for diarrhoea, physical examination, laboratory investigations requested and done as well as treatment received. The laboratory investigations considered in this audit were serum electrolyte, stool microscopy and HIV screening.

Data management

The data extracted from the patient records was collated and entered into Microsoft Excel 2007. Data cleaning was done before analysis using this package.

RESULTS

Record of history of diarrhoea illness in the children

The duration of diarrhoeal illness was recorded in 242 (65.4%) case records while stool consistency was recorded in 189 (51.1%). The report on other aspects of diarrhoeal illness was below 50% (Table 1). The overall report on the risk factors for diarrhoea illness was below 40% (Table 2).

There was a statistically significant difference in the reporting of these risk factors between health care providers in the primary and secondary facilities. The secondary health facilities were more likely to provide report on diarrhoea illness and risk factors than the primary facilities.

There was a statistically significant difference in the reporting of physical findings between children managed in secondary health facilities compared with those managed in the primary facilities as displayed in Table 3.

Table 1: Record of history of diarrhoeal illness in the children.

History of illness	Number (%) with record of history of diarrhoea illness			χ^2 test	P- value
	Primary facilities (n = 279)	Secondary facilities (n = 91)	Total (n = 370)		
Duration of diarrhoea	168 (60.2%)	74 (81.3%)	242 (65.4%)	13.5	0.0002
Stool consistency	119 (42.7%)	70 (76.9%)	189 (51.1%)	32.25	<0.0001
Stool frequency	64 (22.9%)	57 (62.6%)	121 (32.7%)	49.13	<0.0001
Estimated stool volume	23 (8.2%)	11 (12.1%)	34 (9.2%)	1.21	0.270
History of blood in stool	23 (8.2%)	1(1.1%)	24 (6.5%)	5.77	0.016
History of vomiting	129 (46.2%)	48 (52.7%)	177 (47.8%)	1.165	0.280
History of associated fever	130 (46.6%)	21 (23.1%)	151 (40.8%)	15.71	<0.0001
Urine output	50 (17.9%)	7 (7.7%)	57 (15.4%)	5.50	0.0189
History of home treatment	46 (16.5%)	25 (27.5%)	71 (19.2%)	5.33	0.021

Table 2: Record of risk factors for diarrhea in children.

Risk factors for diarrhoea	Number (%) with record of risk factors for diarrhoea			χ^2 test	P- value
	Primary facilities (n=279)	Secondary facilities (n=91)	All facilities (n=370)		
Nutritional history	70 (25.1%)	61 (67.0%)	131 (35.4%)	52.78	<0.0001
Immunization history	29 (10.4%)	48 (52.7%)	77 (20.8%)	74.68	< 0.0001
Source of drinking water	15 (5.4%)	41 (45.1%)	59 (15.9%)	84.11	< 0.0001
Sewage disposal method	14 (5.0%)	42 (46.2%)	56 (15.1%)	90.40	< 0.0001

Table 3: Physical examination of the children with diarrhoea.

Physical assessment	Number (%) with record of physical performed			χ^2 test	P-value
	Primary facilities (n = 279)	Secondary facilities (n = 91)	All facilities (n = 370)		
General examination ^a	18 (6.5%)	68 (74.7%)	86 (23.2%)	179.28	< 0.0001
Level of consciousness	22 (7.9%)	59 (64.8)	81 (21.9%)	130.15	< 0.0001
State of hydration	34 (12.2%)	39 (42.9%)	73 (19.7%)	40.75	< 0.0001
Pulse rate	14 (5.0%)	28 (30.8%)	42 (11.4%)	45.22	< 0.0001
Skin turgor	123 (44.1%)	78 (85.7%)	201 (54.3%)	47.92	<0.0001

^aGeneral examination = respiratory rate, pallor and jaundice

Table 4: Record of laboratory investigations.

Laboratory investigations	Number (%) with laboratory investigations requested			χ^2 test	P-value
	Primary facilities (n = 279)	Secondary facilities (n = 91)	All facilities (n = 370)		
Investigations requested					
Serum E/U/Cr ^x	13 (4.7%)	13 (14.3%)	26 (7.0%)	171.65	< 0.0001
Stool microscopy	12 (4.3%)	13 (16.7%)	25 (6.8%)	10.86	< 0.0001
HIV screening	10 (3.6%)	31 (34.1%)	41 (11.1%)	64.71	< 0.0001
Investigations performed					
Serum E/U/Cr ^x	7 (53.8%)	11 (84.6%)	18 (69.2%)	2.89	0.089
Stool microscopy	3 (25.0%)	12 (92.3%)	15 (60.0%)	11.78	0.0006
HIV screening	10 (100%)	28 (90.3%)	38 (92.7%)	1.04	0.306

^xSerum E/U/Cr = Serum Electrolyte, Urea, Creatinine

Record of physical examination of the children

Apart from skin turgor, which was recorded in 201 (54.3%) case records, other aspects of physical examination were recorded in less than 25%.

Record of laboratory investigations for diarrhoea

The overall request for investigations in children with diarrhoeal diseases was about 10%. There was a statistically significant difference in the request for investigations between children managed in the primary health facilities and those managed in the secondary health facilities as shown in Table 4.

DISCUSSION

The findings of this audit show a deficiency in the evaluation of under-fives with diarrhoea by health workers in facilities in the State. Evaluation of children was better in the secondary than primary health facilities. Adequate patient evaluation is important in identifying risk factors for diarrhoea, making accurate diagnosis and instituting appropriate treatment for the disease.

Information obtained from caregivers on history of diarrhoeal illness was grossly inadequate. With exception of the duration of diarrhoea and stool consistency which were recorded in more than 50% of the case records, the other essential aspects of diarrhoeal history were recorded in less than half of the case records audited. Diarrhoeal history such as estimated stool volume, associated fever, vomiting or passage of urine which are necessary for determining the severity of the illness, associated comorbidities, complications and prognostication of treatment outcomes were not adequately elicited. Failure to obtain this information as observed in this audit would invariably lead to inappropriate or inadequate patient management as was observed in this audit.

History of the potential risk factors for diarrhoea was obtained in less than 40% of all the case records evaluated. Since most cases of diarrhoea diseases are preventable, it is important for health care providers to seek to identify the possible cause or risk factor(s) for a given episode of the illness so as to be able to counsel caregivers on ways of preventing recurrences. Repeated episodes of diarrhoea have been shown to impact negatively on the wellbeing and nutritional status of under-fives. Most cases of under-five mortality have malnutrition as an underlying factor and diarrhoea disease is a notable risk factor for childhood malnutrition especially in developing countries.¹⁰ Educational interventions by means of counselling on optimum childhood nutrition, immunization, hand washing and proper sewage disposal are cost effective means of preventing childhood deaths from diarrhoea disease.¹¹ Less than 50% of caregivers in a study in Bangladesh recognized the above factors as measures for preventing

childhood diarrhoea.¹² By eliciting history of risk factors for diarrhoea, health care providers would be in a position to identify the possible cause of the illness and to advice caregivers appropriately.

The physical examination of the children managed for diarrhoea was grossly inadequate. With exception of assessment for skin turgor which was reported in about half of the case records, other parameters were assessed in about 20% of the children. The fluid loss in stool and vomiting that sometimes occurs in children with diarrhoea, could lead to significant haemodynamic changes which may result in multi-organ or multi-systemic dysfunction. Therefore, patients with diarrhoea require comprehensive systemic examination which unfortunately was not the case in the records audited.

The frequency of requests for laboratory investigations in the children was also low. The passage of loose stools with or without vomiting does not only deplete body fluid volume but also leads to derangement in electrolytes status of the children. Serum electrolyte estimation can be of diagnostic importance in diarrhoeal illnesses that are complicated with dehydration as the nature of the dehydration can be classified either as hyponatraemic, isonaatraemic or hypernatraemic depending on the serum sodium level. Since the management of the various forms of dehydration differs from each other, serum electrolyte estimation is also of therapeutic importance in diarrhoea case management. The high prevalence of Human Immunodeficiency Virus (HIV) infection in developing countries makes screening for the condition necessary.¹³ HIV infection is usually associated with persistent diarrhoea but screening for the infection could be performed in children with acute watery diarrhoea that are suspected to have the infection. Ntia et al reported HIV prevalence of 5.6% among hospitalized under-fives with acute watery diarrhoea in a tertiary health facility in Cross River State.¹⁴

It is worthy of note that even though there was a low request for investigations for diarrhoea disease by the health care providers, the performance was quite high among those in whom the requests were made. This indicates a good compliance by caregivers to conduct investigations when requested. Since requests for investigations are usually informed by the findings on history and physical examination, there is need for an improvement in the quality of clinical evaluation of patients by health care providers so that only investigations that will aid confirmation of diagnosis and guide treatment options are requested.

CONCLUSIONS

The evaluation of under-fives with diarrhoeal disease by health workers in the State is generally inadequate. There was a steady decline in patients' evaluation from the stage of history of diarrhoea, to physical examination, and laboratory investigation. Strategies for improving

patients evaluation are necessary for better outcome in the case management of under-five diarrhoea in health facilities in the State.

ACKNOWLEDGEMENTS

Authors would like to express profound gratitude to the field workers for extracting data from the patients' case records and the staff of the selected health facilities for their cooperation. They also thank Moriam Chibuzor, Dachi Arikpo and Olabisi Oduwole for contributing to the design and validation of the study tool, also to the staff of the selected health facilities for their co-operation while working in their facilities. This project was supported by the effective Health Care Research Consortium which is funded by UKaid from the UK Government Department for International Development. The UKaid neither played a role in the conduct of the study nor influenced the preparation of the manuscript.

Funding: UKaid from the UK Government Department for International Development.

Conflict of interest: None declared

Ethical approval: The study was approved by the Institutional Ethics Committee

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Cite this article as: Udoh EE, Odey FA, Effa EE, Esu EB, Meremikwu MM. Facility-based evaluation of under-fives with diarrhoea in Cross River State, Nigeria: a clinical audit. *Int J Contemp Pediatr* 2016;3:1173-7.