

AWARENESS AND ACCEPTABILITY OF ROTAVIRUS VACCINE AMONG MOTHERS OF UNDER-FIVE CHILDREN ATTENDING CHILDREN OUTPATIENT CLINIC OF EKITI STATE UNIVERSITY TEACHING HOSPITAL.

¹Babatola A.O ²Ojo T.O ¹Ogundare E.O ¹Ajite A.B ¹Oluwayemi I.O ³Wuraola I. ⁴Fadare J.O ¹Olatunya O. S

¹Department of Paediatrics, Ekiti State University/Ekiti State University Teaching Hospital, Ado-Ekiti, Nigeria.

²Department of Community Health, Obafemi Awolowo University, Ile-Ife, Osun State, Nigeria.

³Department Of Paediatrics, Ekiti State University Teaching Hospital, Ado-Ekiti, Nigeria.

⁴Department of Pharmacology, Ekiti State University/Ekiti State University Teaching Hospital, Ado-Ekiti, Nigeria.

ABSTRACT

Background: Diarrhoea diseases remain a major contributor to infant and under-five morbidity and mortality, particularly in developing countries. Administration of the rotavirus vaccine is one of the effective measures to prevent acute and severe forms of diarrhoea in children. Rotavirus vaccine is yet to be fully incorporated into the National Programme on the Immunization schedule. This study assessed the awareness and willingness of mothers to the uptake of rotavirus vaccine for their under-five children at Ekiti State University Teaching Hospital (EKSUTH), Ado-Ekiti.

Methods: A descriptive cross-sectional survey was conducted among 301 mothers of under-five children attending the Children Outpatient Clinic of EKSUTH. An interviewer-administered questionnaire was used to collect the data. Data analysis was performed with SPSS version 23.

Results: Forty-two (14%) of the mothers had heard of rotavirus vaccine. Most mothers, 277(92%), will allow their wards to take the rotavirus vaccine. Two hundred and eighty mothers (93%) will advocate for the incorporation of rotavirus vaccine into the National Programme on Immunization Schedule. Eighty-five (28.2%) of the respondents, however, had one concern or the other about rotavirus vaccine.

Conclusion: There is a low level of awareness and knowledge about rotavirus vaccines among mothers of under-five children in Ekiti State, Nigeria. Despite this, the willingness to uptake the vaccine was high among respondents. Our findings suggest the need to fully incorporate rotavirus vaccine into the national programme on immunization to make it widely available to mothers and caregivers of under-five children

Keyword: Awareness, Acceptability, Rotavirus vaccine, Under-five children

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INTRODUCTION

Diarrhoea diseases have continued to contribute significantly to infant and under-five mortality worldwide. It is responsible for one in every nine child deaths and kills more than AIDS, malaria and measles combined.¹ About 1.7 billion cases of childhood diarrhoea diseases occur annually with about 525,000 deaths globally.² The burden of diarrhoeal diseases is more in developing countries, and Nigeria is no exception as diarrhoea diseases, malaria, pneumonia, measles and HIV/AIDs account for more 70% of the estimated 1 million annual under-five deaths.³ Diarrhoea diseases are largely preventable, and over the years, a number of measures have proven to be effective in reducing its morbidity and mortality. Beside environmental sanitation, good nutrition, vitamin A supplementation and proper

handwashing, the administration of rotavirus vaccine is an effective measure in preventing acute and severe forms of diarrhoea in children under five years. In Nigeria, rotavirus is responsible for about 30% of diarrhoea diseases in children under-five years.^{4,6}

Currently licensed rotavirus vaccines are RotaTeq® and Rotarix®, and they are live attenuated vaccines. RotaTeq® was developed from human and bovine parent rotavirus strains and recommended to be administered orally, three doses at 6 weeks or after with an interval of at least 4 weeks between doses. Rotarix® was derived from human rotavirus strains and is recommended to be administered orally, 2 doses at 6 weeks or after with an interval of at least 4 weeks between doses. Rotavirus vaccination is not recommended for children more than 24 months of age and contraindications for rotavirus vaccinations include severe allergic reactions following first dose and severe immunodeficiency. The adverse events that may be associated with these rotavirus vaccines include fever, vomiting, diarrhoea and very rarely intussusception.^{7,9}

The World Health Organization (WHO) has recommended that rotavirus vaccine for infants should be included in all national immunization programmes and should be a high priority in southeastern Asia, sub-Saharan Africa and in countries where diarrhoea deaths

Correspondence to:

Dr Babatola Adefunke Olarinre
Department of Paediatrics,
Ekiti State University, Ado-Ekiti.
E-mail: adefunke.babatola@eksu.edu.ng
Phone: 08035682315

account for greater than 10% of childhood mortality.¹⁰ Nigeria is, therefore, qualified to make incorporation of rotavirus vaccine into her national programme on immunization a top priority. Nigeria plans to introduce the rotavirus vaccine into the National Programme on Immunization Schedule in phases commencing in 2018. Although the vaccine was introduced in a Local Government in Lagos State, South-western Nigeria through the support of a non-governmental organization in 2017,¹¹ however, this introduction was restricted to only one local government out of the several local governments in the state. Furthermore, it is yet to be incorporated into the routine immunization programme in Ekiti state and other states of the federation where its introduction and implementation is still being awaited. However, the vaccines are available in most states of Nigeria on a fee-paying basis.

The awareness of service is closely linked with the utilization of the service such that when there is a low level of awareness about a service, it tends to lead to poor utilization of such health service. Awareness tends to influence health-seeking behaviour of individuals, and it also helps individuals to make informed decisions about health-related issues. Nothing drives home this fact than the observation by Konwea and colleagues where they observed that mothers' knowledge of childhood immunization influenced the compliance of mothers to childhood immunization schedule for their children.¹² Considering the fact that the rotavirus vaccine is new in our setting, it is important to assess the level of awareness and acceptance of this vaccine among the stakeholders (Providers and Consumers). Seale et al. in Indonesia found that awareness and acceptance of rotavirus vaccine among different cadres of health workers to be mixed.¹³ However, a study conducted among health care providers in the South-Eastern part of Nigeria reported a high level of awareness of rotavirus vaccines among respondents but about a third of them did not know the type of the vaccine and the route of administration.¹⁴ The study also reported a high level of acceptance of the vaccine among health care workers, though with some level of concern. Studies on the awareness and acceptance of rotavirus vaccine amongst mothers who are the consumers will be important because the information from the study may assist policymakers in preparation for the introduction of the vaccine to ensure effective immunization programme.

Hence, this study assessed the awareness and willingness of mothers of under-five children attending the children outpatient clinic of Ekiti State University Teaching Hospital, Ado-Ekiti to uptake rotavirus vaccine for their infants. This study also assessed possible barriers to uptake of rotavirus vaccine among mothers of under-five children.

Materials and methods

A descriptive cross-sectional survey was conducted among 301 mothers of under-five children attending the Children Outpatient Clinic of Ekiti State University Teaching Hospital (EKSUTH) Ado-Ekiti. Ado-Ekiti is the capital of Ekiti State, situated in the south-west region of Nigeria, with a population of 308,621 as reported in the 2006 National census.¹⁵ EKSUTH is one of the two tertiary institutions in Ekiti State, and it serves as a referral centre to

3 Specialist and 17 General hospitals in the state.

We collected data using an interviewer-administered semi-structured questionnaire. The interviewers were junior doctors trained on administration and interpretation of the questionnaires in both English and the local language. After explaining the purpose of the study to the respondents and obtaining their informed consent (verbal), the questionnaires were administered to them. The questionnaire has three sections—the first section of the questionnaire comprised of age, occupation, number of children, etc. The second section had questions on rotavirus vaccine; the illness rotavirus vaccine protects from, types of rotavirus vaccine, route of administration of rotavirus vaccine and the dose of rotavirus vaccine. The third section comprised questions that assessed acceptance of rotavirus vaccine by respondents. The social classification of respondents was determined using both formal educational attainment and occupation of the parents as described by Oyedepi.¹⁶

Data analysis: Data analysis was performed with SPSS version 23. Discrete variables were summarized using frequency tables and percentages, while quantitative variables were analysed using mean and standard deviation. Tests of association between selected variables and respondents' willingness to accept vaccination were done using Chi-square. A p-value of less than 0.05 was regarded as statistically significant.

Ethical consideration: Ethical approval for the study was obtained from the Ethics and Research Committees of the Ekiti State University Teaching Hospital. Informed consent was obtained from every respondent prior to data collection.

Results

Three hundred and one mothers of under-five children participated in the survey. About 60% of the respondents were aged 25-34 years. The mean age of the respondents is 32±5.7 years. Majority 288(95.7%) of them were Christians, 295 (98%) were married, and 246(81.7%) had tertiary education. Majority (84.0%) of the fathers of the under-five children had tertiary education. About half (48.8%) of the respondents were in social class 2. Seventy-nine percent (237) of the respondents disclosed their average income and 107(45.1%) earned >100,000 naira. Only 4(1%) of the 297 women who stated the number of children in their family had more than 4 children (Table I). Forty-seven (15.6%) of the respondents did not have any child who had completed the National programme on Immunization schedule (NPI). Only 2(0.66%) of the respondents had children who had taken vaccination outside the NPI schedule and of this two, one had the vaccine at a tertiary hospital and the other as part of a private school health programme. The cost of the vaccine the children had outside NPI was about 12,000.00 naira per dose.

Mothers' Awareness about Rotavirus vaccine

Only 42(14%) of the mothers have ever heard of rotavirus vaccine. 31(10.3%) knew the illness rotavirus vaccine protects against. About half (20/42) of those that we're aware of rotavirus vaccine got the information through health talks at the immunization clinics, 3 from the immunization care card (road to health card) and 3 from

other sources (poster, friend etc.) (Figure 1). Only 6(2%) knew the types of rotavirus vaccine correctly, 11(3.65%) knew the right timing for the administration of the vaccine and the correct number of doses required, 17(5.64) knew the right route and 4(1.33%) knew that some adverse events could follow the administration of the vaccines.

Mothers' willingness to vaccinate their under-five children

Majority 277(92%) will allow their wards to take the rotavirus vaccine. Two hundred and eighty-two (94%) of them will recommend the vaccines to other mothers, and 280(93%) will advocate for the incorporation of rotavirus vaccine into the National Programme on Immunization Schedule (Figure 2). Eighty-five (28.2%) of the respondents, however, had one concern or the other about the rotavirus vaccine. Forty-one (13.6%) stated safety as a major concern they had about rotavirus vaccine. Other concerns identified were cost 32(10.6%) and being new 12(4.0%)

Factors influencing willingness to accept rotavirus vaccine

There was no association between socio-demographic characteristics such as the age of mother, educational attainment of the mother, social class, numbers of children, marital status, religion, average income and willingness to accept rotavirus vaccine (Table II).

Discussion

Acute watery diarrhoea continues to contribute significantly to under-five morbidity and mortality although its incidence and fatality rate has drastically reduced following some simple and effective interventions like the use of oral rehydration solution, zinc supplementation, potable water, sanitation and hygiene interventions (WASH). Introduction of rotavirus vaccination will amplify this reduction. Introducing new vaccines is often fraught with challenges which must be addressed to achieve successful introduction, good coverage and effective vaccination. One of these challenges is the acceptance of the vaccine. This study, therefore, assessed the awareness, acceptability of rotavirus vaccine and possible barriers to its uptake among mothers of under-five children who are the end-users.

In our study, although more than 80% of the mothers had one child or more that had completed vaccination according to the National Immunization Programme schedule, they had poor awareness and knowledge of rotavirus vaccine as only 14% of them had ever heard of rotavirus vaccine and even fewer (10.3%) knew the illness that rotavirus vaccine protects against. There is generally poor knowledge about rotavirus vaccine amongst the mothers with regards to its route of administration, dosing, timing and possible adverse events. Our findings agree with the reports of Ambike et al. in India, who reported that 25% of their study participants were aware of the rotavirus vaccine.¹⁷ Similarly, some researchers have reported low awareness and knowledge about rotavirus and some other newer vaccines such as pneumococcal conjugate vaccines, typhoid vaccines and measles, mumps, rubella vaccines.¹⁸⁻²¹ Napolitano et al. in Italy, however, reported that about 60% of their study participants who were parents of children between 3 months and 3 years were aware of rotavirus vaccines.²²

This fairly good level of awareness reported in the Italian study may be due to the improved living condition and high literacy level in the country. The poor awareness and knowledge about rotavirus vaccine in our study may be due to the fact that the vaccine is relatively new in our environment and because it is yet to be introduced fully into the national programme on Immunization even though it is available in most health facilities across the country on a fee-paying basis. These findings highlight the need for more education and enlightenment on rotavirus vaccines by the government and all stakeholders.

Of the few mothers (14%) who knew about the rotavirus vaccine, more than 50% of them got the information from health workers. Only a few of them (5%) got the information from the media. Muppudathi et al. in India and Napolitano et al. in Italy reported similar observation.^{19,22}

This probably implies that the government and stakeholders concerned with the implementation of the immunization programmes need to do more campaigns through multiple media engagements to reach out to more people.

That more than 90% of the mothers in our study will allow their wards to take rotavirus vaccine and will advocate for its incorporation into our National Programme on Immunization Schedule is probably a reflection of the high level of acceptance of vaccination as an important medium to prevent childhood diseases and subsequently reduce childhood mortality.^{20,23,24} Dube et al. in Canada reported that most of their study participants who were parents of children 0-6 weeks or those expecting a child had firm intention to vaccinate their children against rotavirus disease.²⁵ Also, Obianjunwa et al. reported that most parents in their study were also willing to accept pneumococcal vaccines even though it was new and yet to be incorporated into the NPI schedule as at then.²⁰ Hence, our finding supports the need for the introduction of rotavirus vaccine in our study locality.

Twenty- eight percent of the mothers had one form of concern or the other about the rotavirus vaccine. This observation is similar to the reports of Wu et al. in Connecticut, USA, where 29% of their study participants expressed worries towards vaccination in general.²⁶ Of the 85(28%) mothers who had a concern about rotavirus vaccine, about 50% of them stated the safety of the vaccine as the cause of the concern. The high cost and the fact that it is relatively new were the other concerns the mothers reported. Similar to our findings, some authors have also reported issues related to safety as one of the barriers to vaccine uptake.²⁷

It is not unexpected that high cost was one of the worries of the mothers about rotavirus vaccine and no wonder 93% of them supported its incorporation into the National immunization programme which will make it to be available to them at no cost. The implication of these is that there is a need for widespread education and campaign about rotavirus vaccine especially with regards to safety issues even when it is incorporated in the national programme to enhance its uptake by the mothers.

The Mothers' age, educational attainment, social class, number of children, marital status, religion and average income were not significantly associated with willingness to accept rotavirus vaccine. This finding is in agreement

with the findings of Obianjunwa et al. in Ile-Ife, Nigeria, who reported no associations between those demographic characteristics and willingness to uptake the new pneumococcal vaccine.²⁰ However, the sample size and the study being from a single centre may account for this observation. Another limitation of the study is the possibility of recall bias since it is a cross-sectional study. Nevertheless, the study has highlighted the important aspects of willingness and acceptability of the rotavirus vaccine in the study area.

Conclusion

This study showed a low level of awareness and knowledge about rotavirus vaccines among mothers of under-five children in Ado-Ekiti, South-west Nigeria.

There is, therefore, a need to provide information and education to improve parents' awareness. The willingness to uptake the vaccine was high, despite some safety and cost concerns raised by the respondents. This study, therefore, suggests the need to incorporate rotavirus vaccine into the national programme on immunization to make it widely available to mothers and caregivers of under-five children.

Declarations

Conflict of interest: The authors declare no conflict of interest.

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Table I: Socio-demographic characteristics of the respondents

Characteristics	Frequency(N=301)	% (Total=100)
Age(years)		
15-24	18	5.98
25-34	177	58.80
35-44	98	32.59
>45	8	2.66
Religion		
Christianity	288	95.68
Islam	13	4.32
Marital status		
Married	295	98.00
Single	6	1.99
Educational attainment of mother		
None	1	0.33
Primary	7	2.33
Secondary	47	15.61
Tertiary	246	81.73
Educational attainment of father		
None	1	0.33
Primary	2	0.66
Secondary	45	14.95
Tertiary	253	84.05
Social Class		
1	64	21.26
2	147	48.84
3	65	21.59
4	24	7.97
5	1	0.33
Income**		
<18,000	18	5.98
18,000-29,000	16	5.32
30,000-49,000	36	11.96
50,000-99,000	60	19.93
>100,000	107	35.54
Number of children*		
1	108	36.36
2-4	185	62.29
>4	4	1.35

*Total respondents-297 **Total respondents-237

Table II: Association between respondents' characteristics and willingness to accept rotavirus vaccine

Characteristics	Willing to accept rotavirus vaccine		Not willing to accept rotavirus vaccine		Total	Statistic Comparison
	N= 277	%	N=10	%		
Age(years)						
15-24	14	87.5	2	12.5	16	$\chi^2=5.917$ Df=3 P=0.116
25-34	164	95.9	7	4.1	171	
35-44	91	98.9	1	1.1	92	
>45	8	100	0	0	8	
Educational attainment of the mother						
None& primary	5	83.3	1	16.7	6	$\chi^2=3.266$ Df=2 P=0.195
Secondary	41	97.6	1	2.4	42	
Tertiary	231	96.7	8	3.3	239	
Social Class						
1	59	96.7	2	3.3	61	$\chi^2=9.252$ Df=4 P=0.055
2	138	97.9	3	2.1	141	
3	55	94.8	3	5.2	58	
4	23	95.8	1	4.2	24	
5	2	66.7	1	33.3	3	
Number of children						
1	98	95.1	5	4.9	103	$\chi^2=0.9214$ Df=2 P=0.631
2-4	171	97.2	5	2.8	176	
>4	4	100	0	0.0	4	
Marital status						
Married	272	96.8	9	3.2	281	P=0.193
Single	5	83.3	1	16.7	6	
Religion						
Christianity	265	96.4	10	3.6	275	P=1.000
Islam	12	100	0	0.0	12	
Average Income(naira)						
<18,000	16	94.1	1	5.9	17	$\chi^2= 1.389$ Df=4 P=0.846
18,000-29,000	15	100	0	0.0	15	
30,000-49,000	34	97.1	1	2.9	35	
50,000-99,000	57	96.6	2	3.4	59	
>100,000	98	100	0	0.0	98	

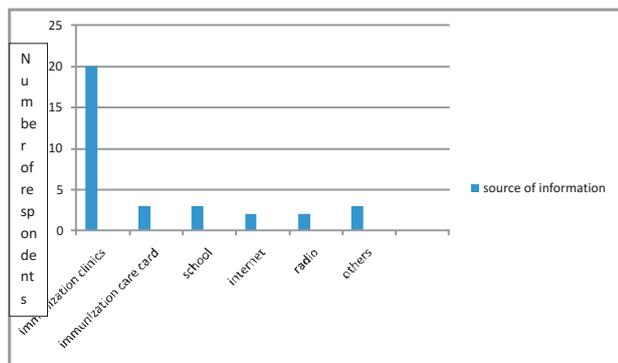


Figure 1: Respondents' sources of information about rotavirus vaccine

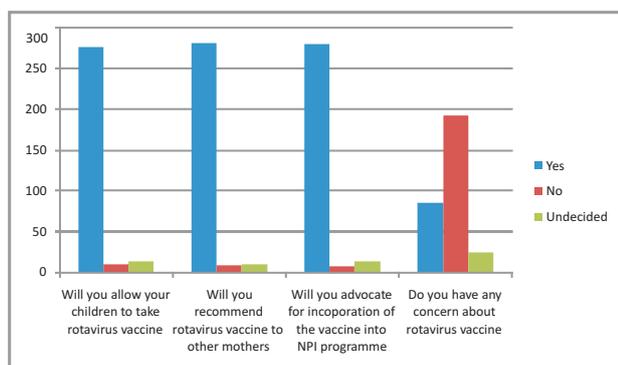


Figure 2: Awareness of rotavirus vaccine and willingness of mothers of under-five children to vaccinate their children

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