

Assessing Mother's Knowledge Regarding the Importance of Rotavirus Vaccine for their Children

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Abstract: Rotavirus gastroenteritis is a major cause of morbidity and mortality among African infants and young children and is the most common cause of severe dehydration. Safe, effective, and affordable rotavirus vaccines are needed for developing countries. So recently the World Health Organization (WHO) has released a global recommendation that all countries include infant rotavirus vaccination in their national immunization programs. In Sudan rotavirus infection deaths represent 10-10.000 per 100.000 for this reason; in day17/7/2011 rotavirus vaccines are administered in all health settings in Sudan (Product: RotaRix; Manufacturer: GlaxoSmithKline; Year Licensed: 2008, suspended March 22, 2010) (Ministry of Health). So, the mother's in Sudan must possess suitable knowledge regarding rotavirus vaccine. Aim of the study: To assess mother's knowledge regarding the importance of rotavirus vaccine for their children. Method: The study is descriptive enrolled mother's age between 20-45 years whom have children with an age less than 6 months, by convenience sample as a case finding (46) mother. Tool: Through structured interviewing questionnaire the data represent the level of mothers' knowledge were collected. Result: The range of study; mother's age was between 20 to 45 years old, with a mean of 32.8 ± 8.4 years, less than half of study, mothers were 30 - 34 years old their number 18 (39.1%). The relation between level of education and level of knowledge regarding rotavirus vaccine among mothers; the majority were secondary school 14, 10 (71.4%) having poor knowledge and the others 4 (28.6%) having good knowledge; as presented there was a significant statistical relationship between mothers knowledge and mothers' educational level; p value 0.08. Recommendation: Community health nurse must be updated with their knowledge about new vaccines, and help in increasing awareness and knowledge regarding rotavirus vaccine and teach the mothers how to manage the adverse effect if it occur.

Keywords: Children; Mothers' knowledge; Rotavirus vaccine.

1. INTRODUCTION

Diarrheal disease continues to represent a major threat to global child health, and was recently estimated to account for 15% of all deaths among children below 5 years of age. Rotavirus is the most important etiological agent of severe gastroenteritis, and is responsible for an estimated 527,000 childhood deaths annually with over 250,000 rotavirus deaths occurring in the African continent. Hence, rotavirus disease prevention in Africa through vaccination is a public health priority to young children. [1]

Diarrheal disease has been recognized in humans since antiquity. Until the early 1970s, the etiology of diarrheal diseases attributed to a bacterial, viral or parasitic agent. In 1973, Bishop and colleagues observed a virus particle in the intestinal tissue of children with diarrhea by using electronic micrograph. This virus was subsequently called "rotavirus" because of

its similarity in appearance to a wheel (Rota is Latin for wheel). In the last few years, rotaviruses have emerged as perhaps the single most important group of pathogens causing diarrheal diseases in children less than 5 years of age, in both developed and developing countries. Rotavirus is responsible for 20–60 deaths per year in the United States and up to 500,000 deaths from diarrhea worldwide. Rotavirus may remain viable in the environment for weeks or months without damage if not disinfected. Rotaviruses cause infection in many species of mammals, including cows and monkeys. These animal strains are anti-genetically distinct from those causing human infections, and they rarely cause infection in humans. The virus enters the body through the mouth. Viral replication occurs in the villous epithelium of the small intestine. Replication outside the small intestine and systemic spread of the virus (viremia) are believed to be uncommon in immune competent persons. CDC. Addition of severe combined immunodeficiency as a contraindication for administration of rotavirus vaccine. The signs, symptoms and stool characteristics of rotavirus diarrhea are nonspecific, and similar condition may be caused by other pathogens. As a result, the confirmation of a diarrheal illness as rotavirus requires laboratory testing. [2]

Rotavirus infection is typically more severe than other common causes of childhood diarrhea, and is more likely to be associated with dehydration, hospitalization, and death. Some estimates have shown that 20%–40% of all hospitalizations and 20% of deaths from diarrhea are due to rotavirus in children less than 5 years. Rotavirus preferentially infects the mature villous enterocytes (intestinal epithelial cells) of the upper small intestine. [3]

About 600,000 children die every year from rotavirus, with more than 80% of all rotavirus-related deaths occurring in resource-poor countries in south Asia and sub-Saharan Africa. Rotavirus-related deaths represent approximately 5% of all deaths in children younger than 5 years of age worldwide. The time period from initial infection to symptoms for rotavirus disease is around two days. The clinical manifestations of infection vary and depend on whether it is the first infection or reinfection. The first infection after 3 months of age is generally the most severe. Symptoms of first infection include fever {Up to one-third of infected children may have a temperature greater than 102°F (39°C)}, vomiting, and self-limited watery diarrhea. Abdominal pain may also occur, and infected children may have profuse watery diarrhea up to several times per day because infection can result in decrease intestinal absorption of sodium, glucose, and water, decreased levels of intestinal lactose, alkaline phosphatase, sucrose activity, and may lead to isotonic diarrhea. [4]. In Sudan child mortality rate due to rotavirus disease represent 50 to 100 deaths per 100,000. [5]

Severe dehydration can develop as a result of loss of body fluid due to profuse watery diarrhea secondary to rotavirus infection, so it is important to recognize and treat this complication of rotavirus infection. Also, parents should be aware of the symptoms of dehydration that can occur with rotavirus infection or with other serious conditions. [6]

To alleviate this substantial burden of disease, two live, oral rotavirus vaccines a monovalent rotavirus vaccine and a pentavalent rotavirus vaccine are now available for use in over 100 countries. Beginning in 2006, many countries in the Americas and Europe adopted rotavirus vaccines into their national immunization programs following availability of clinical trial data from these regions. In 2009, after data on efficacy of rotavirus vaccines became available from Africa and Asia the Strategic Advisory Group of Experts (SAGE) of the World Health Organization (WHO) recommended inclusion of rotavirus vaccines in all national immunization programs worldwide. [7]

After successful clinical trials of the rotavirus vaccines Rotarix (GSK Biologicals, Belgium) and RotaTeq (Merck & Co., USA) in Europe and the Americas, the World Health Organization (WHO) recommended that rotavirus vaccines should be included in the national immunization program in regions where efficacy data suggested that there would be a significant public health impact. The question remained as to how both rotavirus vaccines would perform in the world's poorest countries in Asia and Africa. [8] [9]

In 2006, two live-attenuated rotavirus vaccines were licensed, which was followed in 2009 by the World Health Organization (WHO) recommendation to include them in the national immunization programs of all countries with high diarrhea-related child mortality. These two vaccines have been demonstrated to be safe and efficacious in preventing severe rotavirus diarrhea among children in middle-income and high-income countries, however, the immunogenicity and efficacy of these vaccines in selected low-income countries of Africa, Asia and Central America where the vaccines are needed most was low. [10] [11]

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RV5 vaccine consists of 5 live reasserting rotaviruses, containing G1, G2, G3, G4, and P; genes from human strains on a bovine (WC3 strain) background. RV1 vaccine consists of a live, attenuated human G1P rotavirus. [12]

Recovery from a first rotavirus infection usually does not lead to permanent immunity. After a single natural infection, 38% of children are protected against any subsequent rotavirus infection, 77% are protected against rotavirus diarrhea, and 87% are protected against severe diarrhea. Subsequent infections, discuss progressively greater protection and are generally less severe than the first. Recurrent rotavirus infections affect persons of all ages . Recurrent infections are usually asymptomatic or result in mild diarrhea that may be preceded or accompanied by vomiting and low-grade fever. [13]

All full term infants should begin the series between the ages of 6-14 weeks of age. Breast fed infants can receive rotavirus vaccine . There is limited information on the immunization of infants born at less than 37 weeks gestation; but consideration should be given for immunization of these children because they may be at increased risk for hospitalization from gastroenteritis in the first year of life. These vaccines should not be administered after 7 months of age because of insufficient data on vaccine safety in children who are 8 months of age and older . A child who has had a life-threatening allergic reaction to a previous dose or a component of the vaccine should not get another dose. A child who has had a life-threatening allergic reaction to latex rubber should not receive the RotaRix vaccine; which is packaged in a latex applicator .There is no safety information for administration of rotavirus vaccine to infants who are immunocompromised. However, both children and adults who are immunocompromised because of congenital immunodeficiency or following transplantation can experience severe and potentially fatal rotavirus gastroenteritis . Infants who have received blood products should have the vaccine postponed for 6 weeks unless that delay might make the child ineligible for vaccination because of age . People who are moderately or severely ill should consult with their physician before receiving any vaccine. [14]

Dosage Schedule : Rotateq is administered at 2, 4 and 6 months of age and RotaRix is administered at 2 and 4 months of age. The first dose of rotavirus vaccine should be given between the ages of 6 and 14 weeks. The vaccine series should not be started in children who are 15 weeks of age or older. Doses should be given at least 4 weeks apart .The final dose of rotavirus vaccine should be given before 8 months of age. Rotavirus vaccine may be given at the same time as other childhood vaccines. The rotavirus vaccination series should be completed with the same product whenever possible. [15] Both Rotateq and RotaRix have been shown to be effective against rotavirus gastroenteritis of any severity and both have high efficacy against severe rotavirus gastroenteritis. [16]

Children may be more likely to experience mild, temporary diarrhea or vomiting within 7 days after getting a dose of rotavirus vaccine than children who have not gotten the vaccine. No moderate or severe reactions have been associated with these vaccines .There are a number of rare but serious side effects, but not limited, which include: A high fever; any unusual behavior changes (aside from the usual fussiness that typically occurs after vaccinations) , seizure, signs of an allergic reaction, such as :An unexplained rash, hives, itching, swelling of the mouth or throat, wheezing and difficulty in breathing. [17]

SIGNIFICANCE OF THE STUDY:

Rotavirus is considering a major responsible cause of diarrheal diseases among infant and young adult. The rotavirus vaccine had been discovered to minimize morbidity and mortality due to Rota virus infection, in Sudan rotavirus related death represent 10-10.000 per 100.000 . So that, the mother's must posses' suitable knowledge regard rotavirus vaccine.

AIM OF THE STUDY:

To assess mother's knowledge regarding the importance of rotavirus vaccine for their children.

2. METHODS

This section begins by presenting the research design, followed by setting and study population, inclusion, sampling technique; data collection instrument; procedure of data collection; ethical considerations; data management and statistical analysis

2.1 Design: - A descriptive community based research design was used.

2.2 Settings: - This study was conducted in Khartoum locality; Mayo medical center

2.3 Study population: - The target population for this study were all mothers whom having infants less than 6 months age and attending to the Mayo medical center for the purpose of vaccination at the time of the study (5 October 2016 to 31 December 2016). There were a total of approximately 46 infants as total coverage by the convenience sampling method

2.4 Inclusion criteria: - Mothers who live in Mayo area and having children less than 6 months of age and agree to participate.

2.5 Sampling technique: - Head of Mayo medical center give agreement for conducting the study. Information about the study was given to them, including the purpose of the study. They were informed that mothers of infants' participation in the study were voluntary and that the mothers could withdraw at any time.

2.6 Data collection instruments: - Data was collected through using the A structured interview questionnaire

2.7 Procedure of data collection: - Verbal approval was obtained from the head of Mayo medical center expressing a formal request to conduct the research study and seeking permission to do so. The agreement provided before conducting the research study. Subsequent to ethical approval being obtained, the eligible mothers were identified considering their infants and they were invited to participate in the research study. Prospective participants attended individual and small group meeting where the researcher made it very clear to mothers that their participation was voluntary and they were free to withdraw at any time.

2.8 Data management: - Data were collected by questionnaire from the mothers, by researcher. Manual coding was used to check any error in coding. The coding manual and dummy tables were developed before entering the data. Double entry of data from researcher was done to prevent potential data entry error. The data were checked and cleaned by performing preliminary frequency distribution to enhance accuracy and reliability.

2.9 Data analysis: - Data were analyzed by computerized method Statistical Package for the Social Sciences (SPSS) version 17.

2.10 Ethical considerations: - Ethical approval was obtained from the medical center administrator. All mothers of children less than 6month were given information about the study, and verbal consent was obtained for each .

3. RESULTS

Table. (1): Demonstrated the mother, age characters. The range of study mother's age was between 20 to 45 years old, with a mean of 32.8 ± 8.4 years. As shown from the table, less than half of study, mothers were 30 - 34 years old their number 18 (39.1%).

Fig. (1): Showed the mother educational level. As shown from the figure the illiterate mothers under the study representative 2%, and the majority of them were secondary level of education representing 30% of mother under study. Where by khalwa education level were 11%, primary school was 26%, university level was 22% and post university level was 9%.

Fig. (2): Present the level of mothers' knowledge regarding rotavirus is a contagious disease. As noticed from the figure, more than half of studied mother (67%) known that the rotavirus is contagious disease and the other (33%) were not.

Table. (2): Illustrated the level of mother's knowledge regarding some question of rotavirus vaccine. As represent in the table there is half of mother under study (50%) heard about the importance of rotavirus vaccine and the other half didn't know (50%), 47.8% of mothers know the sign and symptom of rotavirus infection and the other 52.2% they didn't know the sign and symptom of rotavirus infection, 45.7% of mothers know the number of doses require to protect their children from rotavirus infection and the other 54.3% they didn't know , 43.5% of mothers know the appropriate age for giving vaccine and the other 56.5% they didn't know; 19.6% of mothers know how to manage the side effect of vaccine and the other 80.4% they didn't know how to manage the side effect of vaccine.

Fig. (3): Illustrated the mother's knowledge regarding the meaning of rotavirus vaccine. As shown from the figure 57% of mother under study know what is rotavirus vaccine, the rest were not.

Table. (3): Presented the relation between level of education and level of knowledge among mothers, the majority were secondary school 14, 10 (71.4%) having poor knowledge and the others 4 (28.6%) having good knowledge, As presented there was a significant statistical relationship between mothers knowledge and mothers' educational level as, p value 0.08.

Fig. (4): Demonstrated the mother's knowledge regarding the side effect of rotavirus vaccine. As Shown from the figure, 46% of mothers under study have a poor level of knowledge, 24% have good knowledge, and 30% have fair knowledge regarding the side effects of rotavirus vaccine.

Table1: Mothers age in years

Age groups	(No & %)	X ± SD (years)
20 - 24	6 (13.1)	32.8 ± 8.4
25 - 29	14 (30.4)	
30 - 34	18 (39.1)	
35 - 39	4 (8.7)	
40 - 45	4 (8.7)	
Total	46 (100)	

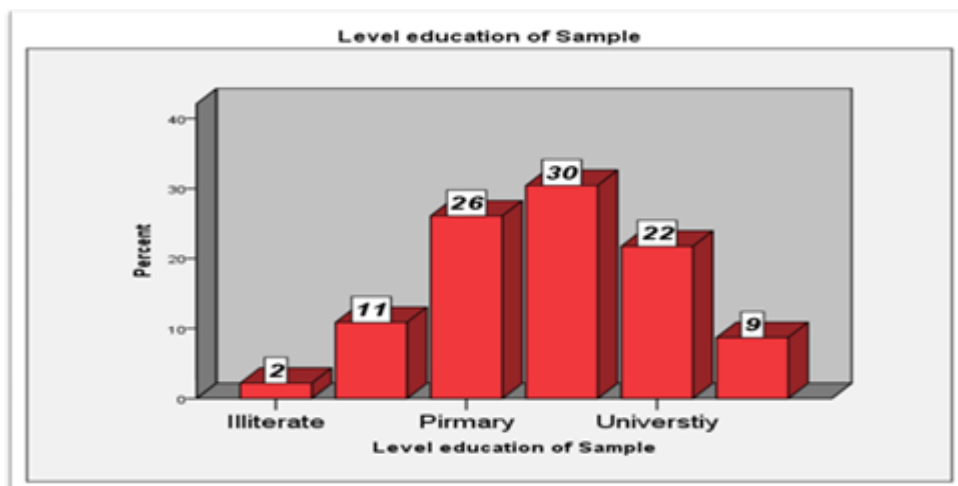


Fig 1: Level of education among studies mother's

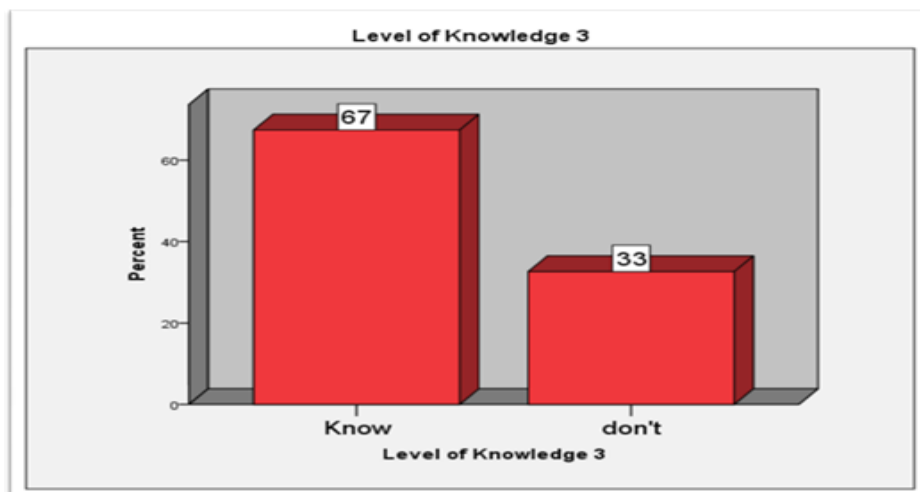


Figure 2: Mothers' knowledge about rotavirus infection is it contagious disease or not.

Table 2: Level of mother's knowledge regarding some questions about rotavirus vaccine

QUESTIONS	LEVEL OF MOTHER'S KNOWLEDGE (NO & %)	
	KNOW	DON'T KNOW
Are you hearing about rotavirus?	23 (50)	23 (50)
What are the signs and symptoms of rotavirus infection?	22 (47.8)	24 (52.2)
What are the number of doses require to protect children from rotavirus infection?	21 (45.7)	25 (54.3)
What's the appropriate age for giving the vaccine?	20 (43.5)	26 (56.5)
How did you manage the side effect of the vaccine?	9 (19.6)	37 (80.4)

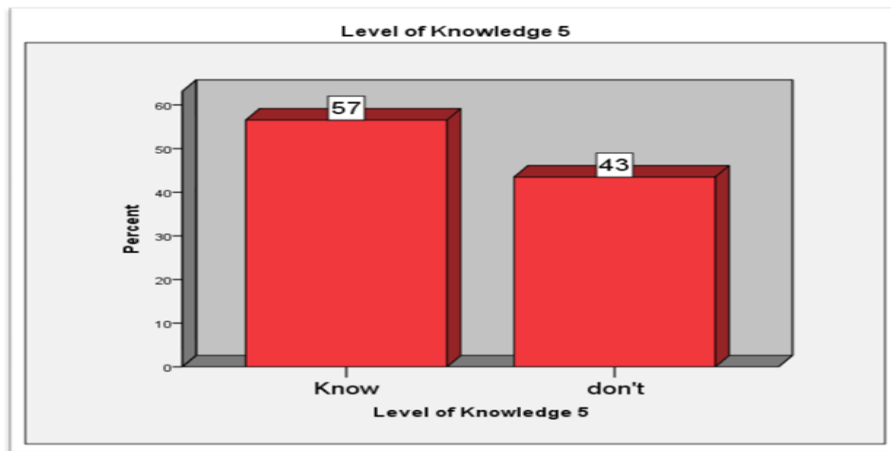


Figure 3: Mother knowledge regarding rotavirus vaccine

Table3: Relation between level of education and level of knowledge among mothers

	LEVEL OF MOTHER'S KNOWLEDGE (NO & %)		P value
	KNOW	DON'T KNOW	
Illiterate	1(100)	0 (0)	0.08
Khalwa	0(0)	5(100)	
Primary	1(8.4)	11 (91.6)	
Secondary	4(28.6)	10(71.4)	
University	1 (10)	9(90)	
Post university	2(50)	2(50)	

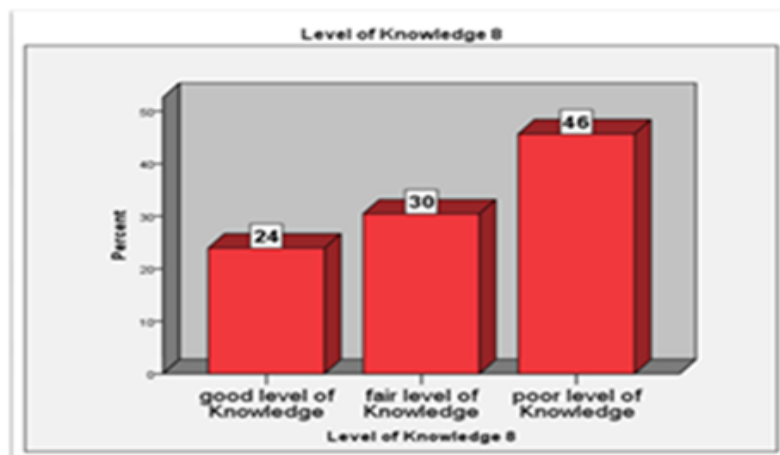


Figure 4: Mothers' knowledge regarding the side effects of rotavirus vaccine.

4. DISCUSSION

The study is about mother's knowledge regarding rotavirus vaccine in Mayo medical center in Khartoum locality, which start from 5 October 2016 to 31 December 2016. All mothers in this study should have an age range between 20-45 years, and have children less than 6 months of age because the vaccine efficacy in the first year of life. [18] The data collected through the interviewer questionnaire as a case finding (46) mothers. The data were analyzed by using SPSS version 17. The result of the study as it is shown in tables and figures is discussed below. The majority of mothers under this study fall in the age group between 30-39 years, the level of education for them primary and secondary level. That means more than 50% of mother under study are educated so that, they must have an acceptable knowledge regarding rotavirus vaccine. The most common cause of severe childhood diarrhea is rotavirus infection, and it is more likely to be associated with dehydration, hospitalization and death, especially in children less than 5 years and these data therefore support the WHO recommendation that rotavirus vaccine should be included in the childhood immunization program. [19] So that should have enough knowledge about this virus, 47.8% of mothers under this study did not hear about rotavirus or what its cause. The incubation period of this virus is just two days, the severity of clinical manifestations varies and depend whether it is the first infection or reinfection. The first one that appeared after 3 month of age are most severe so for this fact the mother must notice and observe the signs and symptoms of rotavirus infection before it get worse, 47.8% of mothers under study have good knowledge regarding signs and symptoms of rotavirus infection, 67% of mothers know if rotavirus contagious or not. 75% of mothers they know and hear about the new rotavirus vaccine, but they did not know the number of doses required to protect their children or even the appropriate age for this vaccination, this lack of knowledge may be due to newly administering of rotavirus vaccine in Sudan in day 17.07.2011. No moderate to severe reaction has been associated with vaccines, but serious side effects can occur, so that others must observe the adverse effects in the first dose to prevent recurrence in the second one. In this study, 46% of mothers under study have a poor level of knowledge regard side effects of rotavirus vaccine.

5. CONCLUSIONS

There was no significant relationship between study variable (age, level of education) and level of knowledge. The level of mother education can affect mother knowledge regarding management of side effect of the vaccine. In this study the educated mother with secondary, university and high are those whom fall in the age group (18-24). In this study the sample size is small (46) mother, if it is large the study finding will be notable and significant, the error percentage will be at minimum, and no result due to chance. The majority of mothers in this study; they know what is rotavirus and if it is contagious or not, and the signs and symptom of rotavirus infection. On the other hand, the mother level of knowledge regarding rotavirus vaccine is poor, they did not know the appropriate child age for this vaccine, and management the adverse effect of the vaccine. By the time, mothers' knowledge regarding rotavirus vaccination will increase because knowledge will be obtainable, so this result as a poor knowledge regarding rotavirus vaccine due to new administering of rotavirus vaccine.

6. RECOMMENDATION

Comprehensive health education programs in Mayo area in a form of home visits about rotavirus infection. Instruct the mother about the importance of vaccination programs for their children through media and advertisement. All health workers in this area must teach the mothers about protective measures against rotavirus infection. The new vaccination schedule programs, must be applied in all health care settings. The community health nurse must be updated with their knowledge about new vaccines, and help in increasing awareness and knowledge regarding rotavirus vaccine and teach the mothers how to manage the adverse effect if it occur.

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