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AWARENESS AND ACCEPTANCE OF ROTAVIRUS VACCINE AMONG MOTHERS OF NEONATES ATTENDING KUWAIT TEACHING HOSPITAL, PESHAWAR-PAKISTAN

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ABSTRACT

OBJECTIVE: To evaluate knowledge of rotavirus vaccine among mothers with association of maternal knowledge with education.

METHODS: This descriptive study was conducted at pediatric unit of a Kuwait Teaching Hospital, Peshawar, Pakistan among 102 mothers using validated questionnaire through convenient sampling from December 2017 to December 2018. All mothers visiting the Paediatric outpatient as well as staying with Paediatric inpatient were recruited with their permission, whereas admitted and sick mothers were excluded. Data was analyzed using SPSS Version- 19. Association of maternal education with mother's knowledge was assessed through Chi square, by setting p values as 0.05.

RESULTS: Mean age of the participating mothers was 26.47±5.5 years. Only 16% (n=16) mothers were aware about the existence of new vaccine for diarrhea, 82.34% (n=84) had never heard about the vaccine and 2% (n=2) were very ignorant. Knowledge in relation to spread (36.3%), administration (16.7%), dose of rotavirus vaccine (11.8%), age at which first dose is given (34.3%) and type of the disease prevented (37.3%) was poor. Acceptance of rotavirus vaccine was found to be excellent (91.2%). Maternal education had significant association with knowledge and awareness of rotavirus vaccine ($p<0.01$). However other parameters like dose ($p=0.68$), spread ($p=0.75$), administration ($p=0.65$), age of vaccination ($p=0.45$) and type of disease prevented ($p=0.54$) had no significant association with maternal education.

CONCLUSION: Awareness of rotavirus vaccine among the mothers of Peshawar was poor, however acceptance was found to be excellent. Maternal education had significant association with knowledge and awareness of rotavirus vaccine.

KEY WORDS: Knowledge (MeSH); Awareness (MeSH); Diarrhea (MeSH); Infant Mortality (MeSH); Immunization (MeSH); Rotavirus (MeSH).

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INTRODUCTION

Worldwide deaths of 5.4 and 2.5 million can be preventable.[1] Pakistan launched expanded program on immunization in 1978 through World Health Organization for pregnant women and newborns. Later on other vaccines were included in the program.[2] Diarrhea being a worldwide challenge is responsible for 10% global child mortality with 40% deaths related to rotavirus. Remarkable progress has been made in the world in improving survival and reduction in child mortalities.[3,4] National rotavirus death estimates among children of less than five years range from 47, 100 to lower than 5 deaths in seventy-nine countries. Rotavirus vaccine was included in Pakistan's EPI program during 2017; funded by Gavi, Bill and Melinda Gates Foundation, World Health Organization and UNICEF.[5] Statistics of 2013 claim 49% Rotavirus deaths in India, Nigeria, Pakistan and Democratic Republic of Congo. Mortality is even larger in Somalia, Angola, Chad and Sierra Leone.[4-6] Diarrheal vaccines were recommended in 2009 by World Health Organization in global immunization programs. Globally six countries account for 30% infant population in Pakistan, Bangladesh, Nigeria, Afghanistan and Democratic Republic of Congo.[6-8] RotaTeq and Rotarix are World Health Organization's approved and live attenuated vaccines given through oral route.[3,9] In spite of advanced and remarkable progress, still diarrheal diseases are major source of morbidity and mortality worldwide.[10]

The Lancet published a survey conducted in India recorded 334,000 deaths in relation to diarrhea in 2005, inferring that one in eighty-two children in India meet death before celebrating their fifth birthday.[11] A matched case control study from Pakistan showed refusal of hospital admissions and delay in reaching the health care facility as the significant predictors.[12] The strong results of Bangladesh study proved and gave insight with motivation to start this vaccine into their immunization programs.[13] Clinical review done by Ghazanfer concluded that rotavirus vaccine is effective, efficient and safe enough to reduce mortalities among

TABLE I: DESCRIPTIVE STATISTICS OF THE STUDY VARIABLES

Knowledge Of Rotavirus & Vaccine		Frequency (%)
From where have you heard about Rotavirus?	Doctors/ Nurses	11 (10.70%)
	Mass Media	01 (1%)
	Friends/ Relative	04 (3.90%)
	Not heard	84 (82.40%)
	Do Not Know	02 (2%)
How Rotavirus is spread?	Through Faeces	37 (36.30%)
	Through Blood	05 (4.90%)
	Through Breathing	01 (1%)
	Do Not Know	59 (57.80%)
Through which route Rotavirus Vaccine is administered?	Oral	17 (16.70%)
	Injection	23 (22.50%)
	Both	01 (1%)
	Do Not Know	61 (59.80%)
How many doses of Rotavirus Vaccine are needed?	One	17 (16.70%)
	Two	12 (11.80%)
	Three	08 (7.80%)
	More than three	05 (4.90%)
	Do Not Know	60 (58.80%)
In which age first dose of Rotavirus Vaccine is given?	6 weeks	35 (34.30%)
	10 Weeks	04 (3.90%)
	14 weeks	19 (18.60%)
	Do Not Know	44 (43.20%)
If first and second dose of Rotavirus Vaccine is missed, can it be given in the subsequent week?	Yes	25 (24.50%)
	No	08 (7.80%)
	Do Not Know	69 (67.60%)
Can Rotavirus Vaccine be given to the babies with the following diseases?	Diarrhea	16 (15.70%)
	High Grade fever	14 (13.70%)
	Drug/ vaccine Reaction	01 (1%)
	None	08 (7.80%)
	Do Not Know	63 (61.80%)
Can the child be breastfed after vaccination?	Yes	35 (34.3%)
	No	67 (65.7%)
What is the vaccination schedule for premature babies?	Same as Full Term Baby	31 (30.40%)
	Different From Them	12 (11.80%)
	Do Not Know	59 (57.80%)
Can Rotavirus Vaccine be given along with other vaccines?	Yes	29 (28.50%)
	No	06 (5.90%)
	Do Not Know	67 (65.60%)
Is Rotavirus Vaccine available free of cost?	True	34 (33.40%)
	False	09 (8.80%)
	Do Not Know	59 (57.80%)
Is Rotavirus Vaccine safe for the baby?	Agree	45 (44.10%)
	Disagree	02 (2%)
	Do Not Know	55 (53.90%)
Which disease is prevented by rotavirus vaccine?	Diarrhea	38 (37.30%)
	Other (T.B, Hepatitis, etc)	07 (6.80%)
	Do Not Know	57 (55.80%)
Is rotavirus vaccine freely available in Government basic health facilities, hospitals and private setups?	Yes	37 (36.30%)
	No	08 (7.80%)
	Do Not Know	57 (55.90%)

children. The Rotavirus vaccination program was found to be cost-effective in Pakistan when the result for the base case was compared with Pakistan per capita gross domestic product (GDP). Pakistan being GAVI-eligible country helped vaccine implementation.[14]

Alarming death figures contributed by Pakistan in diarrhea among children, recent launch of rotavirus vaccine that is not much accepted and associated fears and myths framed our rationale. No articles related to this new vaccine were seen in Khyber Pukhtoonkhwa as well as in other parts of Pakistan as per researcher's knowledge. The researchers aimed at educating mothers and rectifying their fears to accept the newly administered life saving vaccine. The present study aims to determine knowledge and awareness of the mothers regarding rotavirus vaccine visiting pediatrics unit of a private hospital with acceptance of the vaccine.

METHODS

This descriptive study after being approved from the Prime Foundation's Institutional Review Board Committee was conducted at Pediatrics unit of a Kuwait Teaching Hospital of Peshawar, Pakistan in two months after approval from the Institutional Review Board Committee (IRB Approval Number: Prime/IRB/- 2016 17-0084). Mothers who consented upon were enrolled while sick and admitted mothers were excluded from the study. The sample size was calculated by raosoft online sample size calculator as 113 (5% margin of error, 95% confidence interval and response distribution of 92%) with convenient sampling technique, as per busy schedule and heavy duties in the unit. Finally collected forms came out to be 102 as some were not properly filled so they were discarded.

A validated, pretested and self structured questionnaire was designed to assess the knowledge of mothers regarding rotavirus vaccine's mode of transmission, complete doses, its safety and effectiveness with knowledge of the disease against which used along with its availability within the hospitals near to

Have you ever vaccinated any child of yours with Rotavirus vaccine?	Yes	26 (25.50%)
	No	61 (59.80%)
	Do Not Know	15 (14.70%)
Will you vaccinate your child with Rotavirus Vaccine?	Yes	93 (91.20%)
	No	08 (7.80%)
	Do Not Know	01 (1%)
Will you advice others to vaccinate their children with rotavirus vaccine?	Yes	92 (90.20%)
	No	09 (8.80%)
	Do Not Know	01 (1%)

TABLE II: ASSOCIATION OF MATERNAL EDUCATION WITH KNOWLEDGE OF ROTAVIRUS VACCINE

Knowledge of Rotavirus	Maternal Education Chi Square (P- Value)
From where have you heard about Rotavirus Vaccine (RVV)	24.436 (0.01*)
How Rotavirus is spread?	5.821 (0.75)
How RVV is administered?	6.857 (0.65)
How many doses of RVV are needed?	9.247 (0.68)
In which age first dose of RVV is given?	8.881 (0.45)
If first and second dose of RVV is missed, can it be given in the subsequent week?	11.188 (0.26)
Can RVV be given to the babies with the following diseases?	13.011 (0.37)
Can the child be breastfed after vaccination?	0.977 (0.80)
What is the vaccination schedule for premature babies?	1.682 (0.94)
Can RVV be given alongwith other vaccines?	2.652 (0.97)
Is RVV available free of cost?	8.967 (0.17)
Is RVV safe for the baby?	4.418 (0.62)
Which disease is prevented by RVV?	7.868 (0.55)
Is RVV freely available in Government basic health facilities, hospitals and private setups?	2.791 (0.83)
Have you ever vaccinated any child of yours with RVV?	7.372 (0.29)
Will you vaccinate your child with RVV?	1.438 (0.96)
Will you advice others to vaccinate their children with RVV?	0.878 (0.99)

them. The Cronbach alpha values of the knowledge came out to be in acceptable range as 7.8. Pre tested upon 20 mothers' revealed poor knowledge.

All the mothers of childbearing age coming to pediatric wards and out-patient department were included in the study with their consent; whereas admitted and sick females were excluded. While collecting data all the mothers were counseled as well as educated on the spot regarding this life saving vaccine and its importance in reducing infections and thereby combating mortalities.

Data was entered and analyzed in SPSS Version- 22 through descriptive and inferential statistics. Frequency and percentages were calculated for the demographic variables while association of mother's knowledge and awareness was tested with their education through chi square test by keeping p value at 0.05.

RESULTS

A total of 102 participants were enrolled in the study with 100% response rate. The participating mother's ages ranged between 18- 40 years with mean age 26.47±5.55 years. Most of the participants in educational categories belonged to primary 62.70% (n= 64), followed by secondary 20.60% (n= 21) and tertiary level 15.70% (n= 16) whereas only one (n= 1; 1.00%) was an Alima (religious scholar) from madrassa. Pakistani nationals came out to be as 82.40% (n= 84) and 15.70% (n= 16) Afghanis. Most of the participants were residents of district Peshawar (n= 73; 71.60%), 4.90% (n= 5) from Dara Adam Khail, 3.90% (n= 4) hailed from Charsaddah, 03% (n= 3) from Afghanistan whereas the remaining females came from different districts of Khyber Pakhtunkhwa i.e. Kohat, Bannu, Swabi, Jamrud, Dir, Mardan. Mothers having one year child were (n= 19; 18.60%), 21.60% (n= 22) had a two year, 18.60% (n= 19) had five year, 17.60% (n= 18) had three year old child and rest of them had child of four year in age (n= 16; 15.60%).

Table- I depicts the descriptive statistics were presented in the form of frequency and percentages; showing 82.40% completely ignorant mothers of rotavirus vaccine who have never heard about it, 58.80% did not know about the complete dosage and 55.90% were unaware of the disease protected by rotavirus vaccine.

Maternal education had significant association with knowledge and awareness of rotavirus vaccine (Table II).

DISCUSSION

The present study was undertaken to evaluate the awareness and level of knowledge among the mothers visiting Tertiary Care Hospital of Peshawar. According to the results of the present study only (16%) mothers were aware about the existence of new vaccine for diarrhea, 82.40% were unaware and 2% did not know. Knowledge in relation to spread (36.30%), administration (16.70%), dose of rotavirus vaccine (11.80%), age at which first dose is given (34.30%) and type of the disease prevented (37.30%) was poor. Acceptance of rotavirus vaccine was found to be excellent (91.20%). Maternal education (P Value: 0.01) was found significant with knowledge and awareness while rest of the parameters like dose, spread, administration, age of vaccination and type of disease prevented were non-significant.

A community based study of Khartoum, through structured interview, assessed mother's knowledge of rotavirus

vaccine similar to the present study. The mean age of the participating mothers was between 20- 45 years (mean; 32.6±8) contrary to present study findings as mean age as 18- 40 years (26.47±5.55). Level of education revealed 2% illiterate mothers, 30% secondary level, khalwa education level were 11%, primary school was 26%, 22% and post university level was 9% whereas most of the participants in present study belonged to primary 62.70% (n= 64), followed by secondary 20.60% (n= 21) and tertiary level 15.70% (n= 16) whereas only one (n= 1; 1.00%) was an Alima (religious scholar) from madrassa. Here 50% mothers had heard about this vaccine contrary to present study as 16%. Number of doses require to protect their children from rotavirus infection was known to 45.7 % mothers as compared to present study where 11.8% knew, 43.5% of mothers knew the age for giving the vaccine whereas this study revealed 34.30% mothers who knew. This community based study found insignificant statistical relationship betweel level of education and level of knowledge (p value 0.08), whereas present study had significant relationship as 0.01.[15]

A study assessed parent's knowledge, attitudes and behaviors regarding rotavirus vaccine in Naples- Italy in 2018 whereas present study only assessed knowledge and awareness among mothers only. The mean age of the parents, predominantly females came out to be 18- 47 years (33.5±4.9) contrary to this study finding. Higher level education was depicted as 52.5% (n= 158) whereas 15.70% was highest educational level in the present study. Here knowledge level about rotavirus vaccine was 40.7% whereas present study concluded only 16 % knew about it. Uni-variate analysis showed statistical significance between level of education and awareness of vaccine as 0.001, similar to the present study results which showed 0.01.[16]

A study conducted upon mothers by Mukerji R, et al. at a Tertiary Care Hospital in Delhi revealed shocking results. Only 18% of the mothers had an idea about this vaccine, knowledge in relation to the age, dose and administration was very poor. Nearly 83% had no awareness regarding this new vaccine. Education of the mother was found to be significant in relation to vaccine knowledge (p value 0.000).[17] Similar findings were reported from a study in India where 80% were unaware of the new vaccines of childhood vaccination program. Level of knowledge directly correlated with maternal literacy ($P \leq 0.05$) and to a lesser extent with fathers' literacy and advancing age was associated with better knowledge ($P \leq 0.05$).[18] All these findings are similar to the present study with 84.3% unawareness among the mothers and poor knowledge of dose, age and mode of administration of this vaccine however attitude was found to be excellent; but only one difference as present study did not take into account father's education.

A qualitative assessment survey conducted among service providers and parents in United States revealed doctors being well aware with rotavirus burden associated with rotavirus vaccine and disease but still they had concerns over the safety. However parents were poor in knowledge and awareness of the vaccine along with the disease burden by diarrhea and attitude of giving vaccine to their children was under the influence of their physician's recommendations as per their responses.[19] Awareness among parents was low as in present study but researchers did not interview service providers which was lacking in present study.

Manish Patel further produced a supplement article on the effectiveness of this vaccine and carried out a thorough critical analysis. They reviewed the data for protective efficacy of the two newly introduced vaccines against gastroenteritis in children and suggested properly planned case control studies for further insights. The concluded that from the clinical trials conducted in low middle income countries demonstrated highly effectiveness of this new vaccine and was successful in reducing the diarrheal cases among two years of age children and less than that.[20] Although findings of this research are consistent with the present study however they took all the data so far assembled against this rotavirus vaccine and not a single study.

Among all the studies viewed very few found in relation to this rotavirus vaccine and almost all the persons had heard about the respective vaccine but people were unaware of the diseases against which the vaccine gave protection. One such study conducted in an Indian state and Congo Republic revealed moderate awareness regarding ne vaccines availability but the knowledge of dosage, schedule and diseases prevented was low.[21,22]

In another study 40% awareness of the parents about the vaccine was the conclusion but it was conducted on Human Papiloma Vaccine and only 15% of them had knowledge regarding the vaccine and were confident about the virus. Similar results have been shown by Tang CW et al in Taiwan where only 13% were aware of this HPV vaccine.[23]

All these results are consistent with the present study as far as awareness, dosage, schedule and the disease for which prevention is conferred upon, however these are about the new vaccines introduced in the respective countries system and not only about rotavirus vaccine.

Limitation of the study included small sample size, conducted only in one of the Tertiary Care Hospital of Peshawar, so the results cannot be extrapolated to all the population in Peshawar. Future researchers must undertake it with maximum number of participants to have the baseline data.

It is recommended that poor awareness is likely to result in low uptake of the vaccine and hence the desirable gains by introducing it into EPI program might not be achieved fully. Acceptance of rotavirus vaccine was found to be excellent which is very encouraging. Focused publicity and promotion campaigns using mass media are needed to increase awareness and this will further improve the acceptance of rotavirus vaccine among our community. Physicians must be targeted and updated with new marketing surveillance statistics to have a successful Rotavirus immunization programs in the country.

CONCLUSION

Rotavirus vaccine awareness among the mothers of Peshawar was poor, however, acceptance was found to be excellent. Majority of mothers showed willingness to vaccinate their own unvaccinated children as well as advice others to vaccinate their unvaccinated children against rotavirus with rotavirus vaccine. Maternal education had significant association with knowledge and awareness of rotavirus vaccine.

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AUTHORS' CONTRIBUTIONS

Following authors have made substantial contributions to the manuscript as under:

Sa: Conception and design, acquisition of data, drafting the manuscript, final approval of the version to be published

FRM, SHQ & AU: Acquisition, analysis and interpretation of data, drafting the manuscript, critical review, final approval of the version to be published

Authors agree to be accountable for all aspects of the work in ensuring that questions related to the accuracy or integrity ofany part of the work are appropriately investigated and resolved.

CONFLICT OF INTEREST

Authors declared no conflict of interest

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