

Original Research Article

Comparative study of knowledge and practices of childhood immunization among health care providers in Meerut, India

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ABSTRACT

Background: Immunization laid a major milestone in preventive practices in childhood diseases and decreasing mortality rates. However, despite of such impressive immunization programme we are not able to achieve our targeted goals on time. Lack of awareness of immunization practices amongst our health care providers can be one of the reasons behind this.

Methods: Total 300 participants were included in study divided into three groups A, B and C (pediatricians, allopathic practitioners and health providers at PHC respectively). A self-administered questionnaire in English comprising of questions related to knowledge and practices of immunization were given to all participants. Their responses were analyzed and assessed for level of knowledge in each field and then compared with other groups.

Results: In the present study, nearly half of the participants were >50 yrs and it was observed that percentage of correct knowledge was decreasing with increasing age of participants. Correct immunization schedule was known by all the participants. Correct knowledge regarding immunization of unvaccinated child reporting at 1-2 years of age was maximum amongst group A and minimum amongst group C ($P \leq 0.05$). Correct knowledge about use of Refrigerator for vaccine storage and storage temperature of vaccine was also satisfactory in group A (92%) ($p < 0.001$).

Conclusions: After analyzing all responses we can fairly conclude from this study that overall knowledge of immunization practices amongst health care providers was not satisfactory which emphasizes on need of continuous training and supervision of health care providers dealing with immunization.

Keywords: Health care providers, Immunization, Knowledge and practices

INTRODUCTION

Child health is a major concern in developing countries because of the magnitude of the child population and sensitivity of infant to the ecological conditions existing in countries such as ours. Millions of deaths and lifelong disabilities result from the preventable diseases. In spite of rapid advances in the field of antibiotics and chemotherapeutics, prophylactic immunization forms the core of efforts to eradicate communicable diseases.¹

India's Immunization Program is one of the largest in the world in terms of quantities of vaccines used, numbers of beneficiaries, and the numbers of immunization sessions organized, the geographical spread and diversity of areas covered.

Despite these impressive advances some three million children still die each year from vaccine preventable diseases and another three million are permanently disabled.^{2,3}

Over the years it was realized that the immunization coverage of India is not up to the mark, at many places in western Uttar Pradesh the data is very poor. Now after so many years of launch of these programmes, we must look in to the factors leading to failure of immunization programme.

The reasons for the difference in immunization status between developed and developing countries can be multifactorial but are largely related to our resources, prevalent ignorance and illiteracy among our masses and last but not the least lack of proper knowledge and correct practices of immunisation amongst our health care providers.

Our Doctors and Health care provider should have adequate and correct knowledge regarding available vaccines and their usages.^{1,4-7} Lack of knowledge among them could be major factor leading to poor immunization of children; hence their knowledge should be judged from time to time.

The present study is a small Endeavour to judge the existing knowledge and to judge which group of health provider need more training regarding immunization.

METHODS

Present study was a field study conducted under the supervision of department of pediatrics LLRM Medical College Meerut from august 2011 to august 2012 after taking ethical clearance from ethical committee of college. The study population was divided into three groups - Group A included Pediatricians (MD, DCH), Group B included other allopathic practitioner (MBBS and other specialist) and Group C included other health providers (LHV and ANM) in Meerut district.

Sample size: A total of 300 participants were interviewed (100 in each group). Each group was taken by estimate 50% awareness at 95% confidence interval and 10% of absolute precision.

Random selection of names and addresses of Pediatricians, allopathic practitioners and other health providers were done from IAP Meerut register, IMA Meerut register and primary health centers respectively. Participants were interviewed by using a self-administered questionnaire. Information was obtained including name, age, sex, qualification and experience of the practitioners. Questions were regarding immunization schedule as per universal immunization programme (UIP) and others were in relation to BCG, DPT, OPV and measles about dose of vaccine, dose interval of vaccine, route and site of administration of vaccine, age of booster, indication/contraindication, adverse effect, storage and temperature maintenance of vaccines.

Before enrolment in study the participants were taken into confidence, consent was taken and the purpose of

interview was explained to them. All questions were explained and the questionnaire was filled at the same sitting, if needed questions were explained in Hindi also.

The response of each question was carefully tabulated under separate headings, for each questionnaire the number of correct responses were analyzed in terms of complete knowledge, Partial knowledge and if needed category of No knowledge was also included. Participants who scored more than 75% were graded as having complete knowledge, 74-30% were graded as having partial knowledge and below 30% graded as having No knowledge. The responses were counted and calculated as percentages.

Statically test of significance (χ^2 test with merger technique) was applied where ever necessary and presented in tabulated form. The participants were interviewed and whenever necessary correct information was given to them. The correct methods and means were suggested to improve their knowledge regarding vaccine. But it was not enough for them to improve their knowledge in single attempt so they needed frequent follow up.

RESULTS

Among 300 participants (100 in each group) of the study all completed the questionnaire and deposited it in the same sitting. Most of the participants were in more than 50 years age group (46%). 42% between 40-50 years and 12% between 30-40-year age group.

Over all knowledge of the participants was assessed and it was observed that 97% group A, 72% group B and 57% group C participants had complete knowledge of various aspects of immunization being asked in questionnaire. It was also observed that percentage of complete knowledge was decreasing with increasing age in all three groups.

Knowledge about correct age of vaccine administration for different vaccines as per UIP, dose in amount of various vaccines, age of booster and route of vaccine administration was maximum in group A and minimum in group C but it was not statistically significant.

Knowledge about number of doses for various vaccines and dose interval was also minimum in group C and difference for them was found to be statistically significant (Table 1).

Comparing knowledge about vaccination of unvaccinated child reporting at 1-2 year of age was 95% complete in group A and minimum in group C and correct responses regarding vaccination of partially immunized child was also least in group C and difference for both was statistically significant. Majority of participants giving wrong response for partially immunized child advised to repeat whole vaccination schedule for that child. Correct

knowledge about use of refrigerator for vaccine storage and storage temperature was maximum in group A but

rest two groups did not have enough knowledge with statistically significant difference ($p < 0.05$) (Table 2).

Table 1: Knowledge of participants about age, dose, number of doses, dose interval, age of booster and route of administration of vaccines.

Knowledge about	Group A		Group B		Group C		X ²	Df	P value
	CK (%)	PK (%)	CK (%)	PK (%)	CK (%)	PK (%)			
Age of vaccination	100	0	94	6	96	4	5.79	2	0.055
Dose of vaccine	98	2	92	8	90	10	5.57	2	0.06
Number of doses	96	4	89	11	83	17	8.89	2	0.011
Dose interval	100	0	92	8	90	10	9.93	2	0.006
Age of Booster	96	4	95	5	92	8	11.62	2	0.444
Route of administration	100	0	95	5	94	6	5.85	2	0.053

CK (complete knowledge), PK (partial knowledge)

Table 2: Knowledge of participants about vaccination of unvaccinated and partially immunized child, use of refrigerator for vaccine storage and storage temperature.

Knowledge about	Group A			Group B			Group C			X ²	Df	P value
	CK (%)	PK (%)	NK (%)	CK (%)	PK (%)	NK (%)	CK (%)	PK (%)	NK (%)			
Vaccination of unvaccinated child	95	5	0	60	40	0	35	65	0	78.23	2	0.001
Vaccination of partially immunized child	91	9	0	36	64	0	28	72	0	94.21	2	0.001
Use of refrigerator	90	7	3	20	24	56	10	2	88	158	2	<0.001
Storage temperature	92	8	0	16	9	75	13	6	81	166.3	2	<0.001

CK (complete knowledge), PK (partial knowledge), NK (no knowledge)

Knowledge regarding various contraindications for different vaccines was assessed and it was found that >90% of group A participants had correct knowledge about contraindications of vaccines that vaccines should not be given in high fever (100%), convulsions (100%), reaction after first dose of DPT (98%) and progressive neurologic disease, but can safely be given during mild

fever (100%), cough and cold (100%), diarrhea (96%), cerebral palsy (98%), malnutrition (90%), child born to HIV positive mother (86%). There was significant difference in knowledge as compared to group C where they considered mild fever, diarrhea, convulsions, PND, cerebral palsy, malnutrition, and child born to HIV positive mother also as contraindication for all vaccines.

Table 3: Over all knowledge about various vaccines

Group	BCG		OPV		DPT		Measles	
	CK (%)	PK (%)	CK (%)	PK (%)	CK (%)	PK (%)	CK (%)	PK (%)
A	100	0	100	0	100	0	99	1
B	94	6	95	5	92	8	96	4
C	96	4	93	7	95	5	94	6
X ²	5.79		6.77		7.88		3.59	
df	2		2		2		2	
P value	0.055		0.033		0.019		0.166	

CK (complete knowledge), PK (partial knowledge)

When overall knowledge about adverse effect of vaccine was assessed, it was found that maximum knowledge was

in group A and least in group C and it was statistically significant for DPT, OPV and BCG but not for measles.

Most of the health providers stated fever as adverse effect of every vaccine. When overall knowledge about various vaccines was assessed separately group A was found to have maximum knowledge and group C least and difference in knowledge was found to be statistically significant for DPT and OPV (Table 3).

DISCUSSION

The people's acceptance of vaccination programme depends largely on motivation by health care system. The community based medical practitioners and health workers constitute an important segment of this system of providing promotive and preventive health services. The level of care and quality of services provided by them are directly related to the state of knowledge and practices prevailing in them. Thus, to make immunization programme successful and to achieve eradication of these vaccine preventable diseases, the assessment of existing knowledge and practice of Doctors must be undertaken and deficiencies, if any must be corrected by suitable training and reorientation programmes. This study is a modest attempt in this direction. The study was undertaken among pediatrician, other allopathic practitioner and health workers in Meerut district their responses were noted and inference was drawn.

In all three groups of participants it was observed that percentage of correct knowledge was decreasing with increasing age of participants. It may be due to the fact that either the training of the elder doctors was inadequate regarding immunization practices or else with advancing age their knowledge has faded and hence needed to be enhanced from time to time by organizing training programmes for them at regular intervals of time to update their knowledge. Knowledge of participants regarding age of vaccination was assessed and it was observed that all the pediatricians who were interviewed had correct knowledge about age at which vaccine has to be given and it was also satisfactory in rest of the groups for all vaccines. Almost similar result was obtained for dose, doses interval, route of administration and booster doses.

Singh et al reported that the knowledge of the practitioners regarding the number of doses required and interval for each vaccine was not satisfactory. None of the practitioners were aware of the need for oral polio vaccine and DPT vaccination before 3 months of age.⁸ Naik and Shendurnikar reported that 74% of medical students had correct knowledge about immunization schedule and 67.9% had knowledge about doses.⁹ Gupta and Murali reported that knowledge of immunization schedule among health guides was 22.4% and in Anganwadi workers, it was 40.60%.¹⁰

In the present study, the knowledge of all three groups was more than reported by Gupta and Murali. As expected pediatricians had complete knowledge about vaccination schedule. Majority of incorrect responses by

other two groups was 3 months, as the age for the first dose of DPT and OPV. Better responses of our study in compared to Gupta and Murali indicate that perhaps repeated training programmes and seminars organized by health care system has improved over all knowledge of health care provider regarding Immunization schedule and to boost it up furthermore ongoing programmes are needed.

In the present study correct knowledge regarding immunization of unvaccinated children reporting at 1- 2 years of age was assessed and it was observed that nearly all pediatricians were aware of vaccination schedule of unvaccinated child but about half of community based practitioners and about one third of health providers were aware of vaccination schedule of such a child. The findings indicate the widely prevalent confusion and misunderstanding amongst the participants in respect to correct decision regarding immunization of unvaccinated children coming late for vaccination; many stressed that immunization to be started according to the age of children. If age of the child is in more than 18 months booster doses should be given. When knowledge about immunization schedule of partially immunized child was assessed, it was observed that 91% of pediatrician, only 36% practitioners and 28% health providers were aware about it that vaccination should be done with remaining doses. Most of them advised repeating whole schedule in case of missed doses. This will lead to wastage of valuable vaccine and will further create the problem of non-compliance to full immunization schedule. Therefore, scientific information on this matter needs to be disseminated among the practitioners and health workers.

Numbers of misconceptions are prevailing not only in health provider but also in some pediatrician regarding immunization in various minor illnesses which often lead to non-completion or late completion of schedule. The various contraindications for immunization were assessed and it was observed that >90% of pediatricians had correct knowledge about contraindication that vaccine should not be given in high fever, convulsion, in case of reaction after first dose of DPT and Progressive neurological disease, but can be given safely during mild fever, Cough and cold, Diarrhea, cerebral palsy, malnutrition, and child born to HIV positive status mother.

Practitioners in group B were not advocating vaccination even in children with malnutrition and those born to mother with HIV positive status. Health providers in group C were not advocating vaccination even in children having mild fever and cerebral palsy. It is a matter of concern to us as the correct knowledge about giving vaccination in child having various minor illnesses, baby born to HIV positive mother, cerebral palsy and malnutrition was not known by many participants and hence such children were denied vaccination by many practitioners and health workers. This will lead to

passage of a wrong message to the community and next time people themselves will not come for vaccination during these problems and they will advise others also the same thing. Mittal and Kukreja stated that large number of misconception still prevails not only among the general population but even among health professional, which often lead to non-completion of schedule. These are mild cold, cough, diarrhea, prematurity, breast feedings, history of seizures, family history of adverse reactions to vaccine, static neurological diseases.¹¹ None of these conditions warrant postponement of immunization but are frequently made excuses for the same. In malnourished children, there is no different schedule for vaccination; even severely malnourished children are capable of adequate immunological response to DPT vaccine.

In order to keep vaccines potent and to obtain maximum protective benefits it is necessary to maintain cold chain till administration of vaccine. In present study knowledge about temperature maintenance of vaccine was assessed and it was observed that among 300 participants only 40% had correct knowledge about keeping vaccine at right place in refrigerator. Among them who answered correctly 75% were pediatricians, 16.67% Practitioner and 8.33% were health providers. It shows that except pediatrician, rest both group was lagging in having knowledge about keeping vaccine in fridge at right place. So, this was found to be weakest area of knowledge among all groups. When storage temperature of vaccines was asked only 40.33% gave correct answer. Those who gave correct answer 76.03% were pediatricians, 13.22% were practitioners and only 11.75% were health providers. Thus, in this series, knowledge of temperature maintenance was quite unsatisfactory even amongst pediatricians. Similar results were also found by Singh et al.⁸

Shah and Shah also observed in their study that majority of family practitioners who were providing immunization services to the society were also not storing vaccines as per guidelines.¹² They also reported in their study that knowledge about cold chain was also not satisfactory amongst medical students, interns and non-pediatric residents. These finding were similar to the present study. These findings indicate that it is very necessary to emphasize the necessity of cold chain especially to those practitioners who are providing immunization services to the community through periodic training programme. When Knowledge about adverse effects of vaccines was assessed, it was found that pediatricians had maximum knowledge. Agrawal and Idris et al assessed that adverse effect of vaccine and its management was known by 56.7% and 83.3% in rural and urban health worker respectively which is similar to present study in urban district. But knowledge was significantly high in pediatricians group.¹³

Though our study results represent only a small area in western Uttar Pradesh we cannot generalize it but this

raises an alarm for the need of assessment of knowledge, attitude and practices of health care providers in other areas of country as well. Present study has a very good response rate of 100% as responses were collected in same sitting after providing them proper time to give responses. Self-report format of study is one of its limitations but self-administered questionnaire format is most of the time most effective way of gathering objective information in such studies.

CONCLUSION

It is concluded from present study that knowledge of health care providers in Meerut city was not satisfactory about childhood practices of immunization as per current immunization recommendations especially amongst those working at PHC. Major areas of concern are knowledge about vaccine storage, contraindication of vaccines and catch up vaccination of unimmunized or partially immunized child. However, in other areas also there are gaps in knowledge as well noncompliance in practice. It proves that training received by most of them is not satisfactory which underscores the need for more regular and efficient training programmes as a part of continuous education programmes for all health care providers providing immunization services to the society.

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