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Original Research Article

Immunization status of children attending immunization clinic at a tertiary care government hospital of Agra district

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ABSTRACT

Background: Immunization coverage in India has increased over the decades and has led to decrease in child mortality. However challenges remain in terms of partial and no immunization and its causes. This study assesses the immunization status of children attending the immunization clinic and the reasons for partial or non-immunization at tertiary care government hospital of Agra district.
Methods: It was a cross-sectional study and included all children between ages 9 months and 5 years during the study period. A pre-design, semi-structured, face validated and pilot tested was used after written informed consent of care givers. Data was analysed using SPSS.
Results: Of the 652 children enrolled the mean age was 24.2 months. Most of the children were born in an institution (95.2%) and were from an urban area (81.9%). More than one-thirds of the children, 40.2% (n=262) were fully immunized for their age. Of the 390 partially or unimmunized the most common cause was no knowledge of vaccination/next dose (n=120, 30.8%) and inaccessibility/transport issues (n=120, 30.8%). On logistic regression sex of the child, mother's education and occupation, family type were found to be significantly associated with the immunization status.
Conclusions: This study indicated low full immunization and high partial immunization among attendees of immunization clinic in the institution; with lack of knowledge and transport difficulties being the primary reasons for it.

Keywords: Full immunization, Partial immunization, Determinants

INTRODUCTION

Immunization remains a prominent arsenal in the fight against vaccine preventable diseases. The process of immunization has gradually evolved in India from when it was launched in 1978 as Expanded programme on immunization through Universal Immunization Programme in 1985 and Mission Indradhanush in 2014.[1] The basket of vaccines provided have increased and full immunization coverage (FIC) has been raised from 43.5% to 62.0%.[2,3] Immunization remains one of the most cost-effective public health interventions and largely responsible for reduction of vaccine preventable under-5 mortality rate.[2] The Government of India has set an ambitious goal to achieve 90% FIC in all districts of the country and sustain the coverage through immunization system strengthening.[4] However there remains constraints of drop-outs, left-outs, partially immunised and non-immunized in order to achieve this goal. Various studies have explored unawareness, forgetfulness, absence of prior intimation, unavailability of vaccines, fear of side effects, lack of motivation, cultural taboos and

inconvenient time or place as reasons for partial or non-immunization.[5-9] Thus to provide local data this study assesses the immunization status of children attending the immunization clinic and the reasons for partial or non-immunization.at tertiary care government hospital of Agra district.

METHODS

Study type: Cross-sectional study.

Study population: Beneficiaries attending the immunization clinic in the study period and fulfilling the eligibility criteria.

Study area: Immunization clinic of a tertiary care government hospital of Agra district.

Study duration: January to June 2017

Sample size and strategy: All beneficiaries attending immunisation clinic during the study period. Participants were sequentially recruited.

Data collection tools: A pre-design, semi-structured, face validated and pilot tested questionnaire containing the following details:

Details about the beneficiary/child; socio demographic details of the family; detailed vaccination history; and reasons for non/partial immunization (If any).

Operational definitions

Full immunization- 3 doses of OPV, 3 doses of Rotavirus (where applicable), 3 doses of Pentavalent, 2 doses of fractional IPV, 3 doses of PCV (where applicable), MR vacccine -1st dose, JE 1st dose (where applicable).[1]

Partially immunized- The child who had received some of the vaccines but the not all the vaccines.[10]

Unimmunized- The child who never received any vaccination.[10]

Inclusion criteria

All children from 9 months to 5 years of age; childrens for whom mother or father is the primary respondent; and presence of immunization card at the time of interview.

Exclusion criteria

Non consenting individuals.

Methodology

Prior to the start of the interview, the respondents were explained the purpose of study and the nature of questions in the questionnaire. The immunization status of the enrolled subjects was assessed as per the national immunization programme.

The primary respondent (mother/father) were asked about the immunizations received by their children by one year of age and further, if the child is older than one year. This information was verified by crosschecking against the vaccination cards of the children.

If the child was partially immunized or nonimmunized the reasons for the same were recorded. An easily understandable, informed written consent in local language was taken from the participants and their confidentiality maintained.

After establishing rapport and obtaining written informed consent from participating subjects, the information was be recorded in interviewer administrated schedule. All the participants enlisted were provided with a unique ID number.

Ethical issues

Institutional ethical clearance and written informed consent from primary care giver was obtained.

Data analysis

The information collected on the study schedule was transferred on the pre-designed classified tables and analyzed according to the aim and objectives. SPSS (ver 24) software was used for analysis. Qualitative data was represented as proportions and percentages. Mean and standard deviation was calculated where needed. Binary logistic regression was applied to predict the non/partial immunisation status on the basis of sociodemographic determinants.

RESULTS

A total of 652 children were enrolled in the study during the study period January to June 2017 with informed written consent of their accompanying adult. The mean age of the children was 24.2 months (SD=17.7), the minimum age of the enrolled children was 9 months. 56.3% of all children brought in the immunization OPD during the study period were males and for most of them (87.4%), their mother was the primary caregiver. Their mean birth weight was 2.65 kg (SD=0.55). Only 64 (9.8%) children had a birth order 3 or more.

Majority of the children's mother were working (58.6%) Most of the children were born in an institution (n=621, 95.2%) and were from an urban area (n=534, 81.9%). Most of the children belonged from an upper middle-class socioeconomic status as per the Modified Kuppuswamy scale (n=292, 44.8%) (Table 1).

Table 1: Demographic details of the study participants.

	Attribute	Frequency	%
Sex	Male	367	56.3
	Female	285	43.7
Birth Order	1	396	60.7
	2	192	29.4
	3	32	4.9
	4	32	4.9
Mode of Delivery	Normal vaginal delivery	427	65.5
	LSCS	225	34.5
Place of delivery	Home delivery	31	4.8
	Institutional delivery	621	95.2
Area	Urban	534	81.9
	Rural	118	18.1
Religion	Hindu	571	87.6
	Muslim	61	9.4
	Sikh	8	1.2
	Christian	12	1.8
SES	Upper lower	124	19.0
	Lower middle	177	27.1
	Upper middle	292	44.8
	Upper class	59	9.0
Mother's working status	Working	382	58.6
	Homemaker	270	41.4
Type of family	Nuclear family	212	32.5
	Joint family	440	67.5

More than one-thirds of the children, 40.2% (n=262) were fully immunized for their age. The rest of the children were either partially immunized (n=280, 42.9%) or non-immunized (n=110, 16.9%) for various reason (Figure 1). Of the 390 partially or un immunized the causes, no knowledge of vaccination/next dose (n=120, 30.8%), inaccessibility/transport issues (n=120, 30.8%), Vaccine shortage (n=70, 17.9%), bad experience at the immunization centre (n=20, 5.1%), side effects from last dose (n=20, 3.1%), child was sick (n=26, 3.9%), vaccination considered unnecessary (n=25, 6.4%) (Table 2).

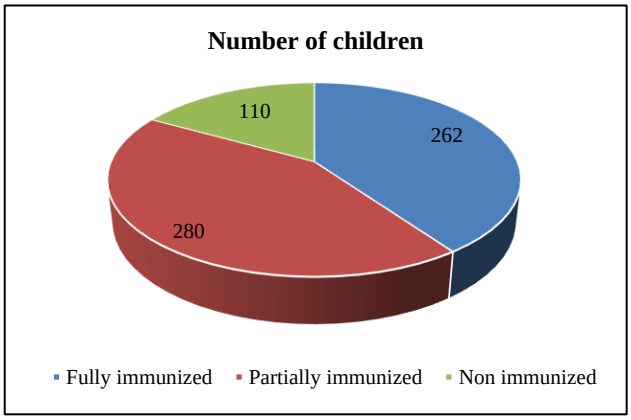

Figure 1: Pie chart showing the distribution of children by status of immunization.

Table 2: Distribution of children by the reason of breaks in immunization.

Reason	Frequency	%
Child was sick	25	6.4
Vaccination considered unnecessary	15	3.8
Transport issues	120	30.8
Vaccine shortage	70	17.9
Bad experience at the immunization centre	20	5.1
Side effects from last dose	20	5.1
No knowledge of vaccination/next dose	120	30.8
Total (partially/unimmunized)	390	100

Table 3: Bivariate associations between partial/ no-immunization and demographic characteristics.

		Partial or non-immunized	Fully immunized	Total	P value	Adjusted odds ratio
Sex	Male	134	233	367	0.000	Reference
	Female	256	29	285		38.6
Mode of Delivery	Normal vaginal delivery	236	191	427	0.001	Reference
	LSCS	154	71	225		0.8
Place of Delivery	Home delivery	5	26	31	0.000	Reference
	Institutional delivery	385	236	621		3.6
Area of residence	Urban	331	203	534	0.016	Reference
	Rural	59	59	118		0.57
Mother Education	Primary school	100	15	115	0.000	Reference
	Middle school	138	54	192		1.2
	High school	57	53	110		1.7
	Senior secondary	62	58	120		0.6

Continued.

		Partial or non-immunized	Fully immunized	Total	P value	Adjusted odds ratio
	Graduate and above	33	82	115		0.2
Mother Occupation	Working	189	193	382	0.000	Reference
	Homemaker		69	270		5.5
SES categories	Upper lower		42	124	0.030	Reference
	Lower middle		61	177		0.88
	Upper middle		135	292		0.98
	Upper class		24	59		0.55
Family type	Nuclear family		177	212	0.000	Reference
	Joint family		85	440		45.4

Upon exploring the bivariate association. Sex of the child was found to be significantly associated with the immunization status ($p<0.05$). Being delivered in an institution and belonging from an urban background were associated with the immunization status and this relationship was found to be statistically significant. Working mother and higher socioeconomic status were significantly associated with a better immunization status

Upon entering the variables found to be significantly associated with the immunization status in a stepwise binary logistic regression model. Sex of the child, mother's education and occupation, family type were found to be still significantly associated with the immunization status. Female sex of the child, non-working mother and belonging from a joint family greatly increased the odds of breaks in immunization (either partial or non-immunized status), the adjusted odds ratio were 38.6, 5.5 and 45.4 respectively. The adjusted odds ratio decreased as the mother's education increased (Table 3).

DISCUSSION

The current cross sectional study was conducted among beneficiaries attending immunization clinic of a tertiary care government hospital in Agra district.

Mean age of beneficiaries was 24,2 (SD=17.7) months which was similar to that in the study by Randhawa et al and Devasenapathy et al at 22.7 (SD=14.9) months and 2.38 (0.77) years respectively.[11,12] Our study found slight male preponderance (56.3%) which was in congruence with studies by, Kumar et al, Srikanth et al, Awasthi et al and Prinja et al at 56.5%, 56.6%, 55.7%, and 55.8%.[9,13-15] More than two-thirds of participants in the present study belonged to joint family structure which was in line with research by Goyal et al.[16] 60.7% of children in our study ere of first birth order which was also observed by Dutta et al at 63.6%.[17] Institutional deliveries accounted for 95.2% which follows the pattern indicated in researches by Gill et al, Srikanth et al and Singh et al at 97.1, 98.8 and 95.1 percentages respectively.[13,18,19] Also it is higher than that in NFHS 4 district data for Agra.[20] Urban predominance similar to the current study was also observed by Sinha et al.[21]

Our study found low immunization coverage with 40.2% full immunization and 42.9% partial immunization. This is in congruence with studies by Sinha et al, Manglik et al and Agrawal et al who noted low full immunization at 40.33%, 46.52% and 41.4% respectively.[21-23] However, it is lower than the district average of full immunization for Agra as per NFHS 4 which is at 60.9%.[20] This may be due to limited sample size and constrained single site used for sampling. In synchronicity with the current study higher proportion of partial immunization was observed in researches by Kumar et al and Agraawal et al at 41.3% and 44.8% respectively.[9,23]

In present study most common cause for no immunization and partial immunization was shared by transport/ inaccessibility and lack of knowledge/awareness regarding vaccination at 30.8%. Similarly transport/ distance was a prominent reason in study by Ahuja et al and Singh et al at 17.6% and 58.2%.[24,25] Also lack of knowledge was reported as an important cause in researches by Ahuja et al, Murugesan et al, Basti et al, Department of Health and Family Welfare (handbook of immunization for medical officers) and Kumar at 52.8, 40, 52.11, 26.3 and 30.3 percentages.[24,26-29]

On logistic regression female sex, delivery by LSCS, institutional delivery and joint family structure were determinants in favour of no immunization or partial immunization in the current study. No immunization and partial immunization decreased with rural residence, mother's increasing education and increased socio-economic status for our study. Similarly higher odds of no immunization for females was observed in study by Patel et al, Francis et al, and Shrivastwa et al at 1.63, 1.16, and 1.2 respectively.[5,30,31] Similar to current study place of delivery was significant for researches by Devendra et al and Rajat et al.[29,32] In congruence with the present study urban residence had higher odds (1.23) of partial immunization as observed by Prinja et al.[15] For mother's education, trend similar to our study was observed by Gupta et al (OR-5.8 in favor of illiterate) and Francis et al.[7,30] Similar to current study mothers'

occupation was significant in studies by Kumar et al and Awasthi et al.[9,14] In congruence with present study Nath et al observed no immunization associated with low socio-economic status (OR-10.8).[33] Similar to our research joint families favored no immunization in study by Nath et al with OR at 2.1.[33]

CONCLUSION

This study indicated low full immunization and high partial immunization among attendees of immunization clinic in the institution; with lack of knowledge and transport difficulties being the primary reasons for it. Female sex of the child, non-working mother and belonging from a joint family greatly increased the odds of breaks in immunization (either partial or non-immunized status).

Recommendations

Since many were partially immunized, it indicates the individuals were already motivated for immunization and therefore efforts have to be focused on addressing their issues locally by providing IEC and facilitating multiple immunization sites closer to their residence.

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Ethical approval: The study was approved by the Institutional Ethics Committee S. N. Medical College, Agra

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