

EVALUATION OF IMMUNIZATION COVERAGE IN THE RURAL AREA OF JAIPUR, RAJASTHAN, USING THE WHO THIRTY CLUSTER SAMPLING TECHNIQUE.

Laxmi Nidhi Pandey^{1*}, Archana Paliwal², B. N. Sharma³, R. C. Choudhary⁴, S. L. Bhardwaj⁵

1. Resident, 2. Assistant Professor, 3. Professor & Head, 4,5. Professor
Department of Community Medicine, Mahatma Gandhi Medical College & University, Jaipur

*Email id of corresponding author- pandey434@yahoo.com

Received: 27/01/2015

Revised: 26/05/2015

Accepted: 30/05/2015

ABSTRACT:

Background: Infectious diseases are a major reason of morbidity and mortality in children. Immunization is an one of the most the cost-effective and easy method for child survival. **Objective-** To evaluate the immunization coverage and it's determinants in 12-23 months old children in rural area of Jaipur. **Materials and Methods:** A cross-sectional study was carried out for assessment of immunization coverage in the field practice area of the Rural Health Training Center (RHTC) using the WHO thirty clusters sampling method. **Results:** A total of 210 children aged 12-23 months were included in the study. It was found that 76.19% of the children were fully immunized against all the six vaccine preventable diseases. While 22.86% & 0.95% are partially immunized & unimmunized respectively. Major reasons for non immunization are lack of awareness for immunization, no faith in immunization and OPV being considered the only vaccine, lack of motivation, lack of information, and various obstacles were the reasons for partial immunization.

Key words – WHO thirty cluster sampling technique, primary immunization, fully, partially & non immunized.

INTRODUCTION:

Immunization has been one of the most significant, cost-effective and stimulatory public health intervention. India, along with the whole world, stands committed to the welfare of children, as reflected in the theme of 'World Health Day, 2005,' viz., “Make every mother and child count”. Globally about one-quarter or 25% of the under-five mortality is due to vaccine preventable diseases. (1)

Even with all the hard work done by the governmental and non-governmental institutes for 100% immunization coverage, there are yet areas with very low coverage. In India, immunization services are offered free in public health facilities, but despite rapid increases, the immunization rate remains low in some areas. According to the National Family Health Survey (NFHS-3) 2005-06, in India 44% of the children

of age one to two years have been fully immunized, whereas in Rajasthan only 26.5% children were fully immunized. (2,3)

According to DLHS-3 (2007-2008) in rural area of Rajasthan, 46.6% children were fully immunized, 13.2% of the children were unimmunized, while the overall rates in the state of Rajasthan were 48.7 % and 12.1 %, respectively.(4)

Unimmunized and partially immunized children were more susceptible to childhood diseases. (5)

The present study was planned to assess the immunization coverage in the rural field practice area of Mahatma Gandhi Medical College, Jaipur to find out the different reasons for partial or non-immunization of children, using the WHO thirty cluster sampling technique.

MATERIAL & METHODS

It was a community based cross sectional study, using the WHO thirty cluster sampling method for evaluation of immunization coverage and associated factors, was carried out in the population of rural area of Sanganer block of Jaipur. There are total 139 villages in Sanganer block and the total population is 148888 (source: health department of Rajasthan govt.).The study was carried over a period of 2 years during 2013-15.

Inclusion criteria:

- i. Children between 12 to 23 months of age.
- ii. Children whose parents/guardians are willing to participate in the study.

Exclusion criteria:

- i. Children below 12 months & above 23 months age.

ii. Children whose parents/guardians are not willing to participate in the study.

The entire population was divided in to 30 clusters. From each cluster, seven children aged 12-23 months were interviewed (total 210) using a pre-designed and pre-tested questionnaire.

The immunization status of the children was categorized as:

- Fully Immunized: When the child had received BCG, Three doses of DPT and three doses of OPV and Measles vaccine by the age of one year.
- Partially Immunized: When the child had received some but not all vaccines.
- Not Immunized: When the child had not received any of the vaccine by the age of one year. Tumour markers hormones

RESULT

In the present study, 210 children of age group 12-23 months, residing in the 30 selected clusters were examined for the history of immunization. Out of 210 children 160 (76.8%) children were fully immunized, 48 (22.86%) children were partially immunized and only 2 (0.95%) children were not immunized. Proportion of fully immunized children was more in favor of females (81.0%) as compared to males (72.7%).[Table 1]

Overall BCG vaccine coverage was 99.05%, Overall DPT 1, DPT 2 and DPT 3 vaccination coverage was 98.6%, 92.8% and 87.1% respectively. As per the study, overall OPV zero dose, OPV 1, OPV 2, OPV 3 vaccination coverage was 56.7%, 96.7%, 90.0%, 84.8% respectively, The Measles vaccination coverage in the present study was 80.0% & Overall vitamin A first dose was received by 42.9% children, 83.3% children received the Pulse Polio

Immunization (PPI) during the last round [Table-2]

In the present study, there were only 2 (0.9%) non immunized children. Major reasons for non immunization were lack of awareness, no faith in immunization and only OPV was considered a vaccine. Lack of motivation, lack of information and various obstacles were the reasons for partial immunization.

Reasons of partial immunization were postponed until another time (20.6%), child ill- not brought to the centre (19.9%), fear of side reactions (19.9%), no faith in immunization(16.2%), unaware of need of immunization (8.1%), unaware of need to return for 2nd and 3rd dose (5.1%), mother too busy (4.4%), polio was considered the only vaccine (2.2%), time of immunization inconvenient (1.5%), wrong ideas about immunization (0.7%), also lack of motivation (36.8%), lack of information (33.8%) and various obstacles (29.4%) were the reasons for partial immunization.[Table-3]

There was a statistically significant association between religion, father's age, education and occupation, mother's education, source of information regarding immunization, birth order of child, birth interval with preceding child, and availability of vaccination card (Table-4). There was a positive association between registration of pregnancy, number of ante natal visits, tetanus toxoid received, attendant of delivery, place of delivery and immunization status.

Since there only two children were non-immunized so test of significance was applied on partially and fully immunized children to find out the association.

DISCUSSION

In the present study, 76.19% children were fully immunized, 22.86% children were partially immunized and 0.95% children were not immunized. Similar observations were made in **Annual health Survey (AHS) (2012-13)** in Rajasthan and **Annual health Survey (AHS) (2011-12)** in Jaipur showing 74.2% and 77.5% fully immunized children respectively.(8) Similar results were shown by **Kumar et al (2015)** where they found 78.5% children were fully immunized and 21.5% children were partially immunized.(6)

Study conducted by **Jariwala et al (2015)**⁷ found similar results, 72% children were fully immunized, 21% were partially immunized and 7% were not immunized. (7)

According to **DLHS-III (2007-08)** in Rajasthan and Jaipur, there were only 48.8% and 51.5 % of children were fully immunized respectively.(9) **NFHS-III (2005-06)** revealed that only 43.5% children were fully immunized in India and 26.5% in Rajasthan.(10)

In our study, fully immunized female children were 81.0% in comparison to male children (72.7%). Similar results were found by **Kumar et al (2015)** in their study where female children (80%) received full immunization in comparison to male children (77.6%). (6)

BCG vaccination coverage in the present study was 90.05%. Similar findings were in the studies conducted by **Jariwala (2015)** and **Gupta et al (2013)** which showed the BCG vaccination coverage to be 91% and 98.57% respectively.(7, 11) Various surveys like **NFHS-III (2005-06)**^{2,3} **India** and **Rajasthan** reported 78.2% and 68.5% coverage for BCG vaccination.

DPT 1, DPT 2 and DPT 3 vaccination coverage in the present study was 98.6%, 92.8% and 87.1% respectively. Similar observations of studies conducted by **Gupta et al (2013)**

showing the high DPT 3 vaccination coverage of 92.38 %.(11) **Annual Health Survey (AHS) (2012-13)**, also revealed high DPT3 vaccination coverage in Rajasthan and Jaipur, 79.6% and 86.2% respectively which is similar to our study. Apparently there has been an improvement in vaccination coverage as compared to earlier studies namely DLHS.(8)

In the present study, OPV 1, OPV 2, OPV 3 vaccination coverage was 96.7%, 90.0%, 84.8% respectively. Studies conducted by **Vohra et al (2013)** in Lucknow and **Seth et al (2012)** showed the lower OPV 3 vaccination coverage was 84.50% and 85.23% respectively.(12,13) **Annual Health Survey (AHS) (2012-13)**, revealed high OPV 3 vaccination coverage in Rajasthan and Jaipur, 80.8% and 86.4% respectively.(8)

In the present study, overall vaccination coverage for measles was 80.0%. Similar results were shown by studies conducted by **Jariwala (2015)** and **Seth et al (2012)**, where the measles vaccination coverage was 78.0%, and 82.20% respectively.(7,13)

In the present study statistically significant association was seen between the religions and immunization status. Father's age, education and occupation were also statistically significantly associated with immunization status. Mother's education was statistically significant with immunization status.

There was a significant association between the sources of information regarding immunization with the immunization status.

As per the study, there was association between the registration of pregnancy, number of ante natal visits, tetanus toxoid received, place of delivery and the attendant who conducted the delivery with the immunization status.

The birth order and birth interval had a statistically significant association with the immunization status. Availability of the vaccination card had a statistically significant association with the immunization status.

CONCLUSION

The immunization coverage of 12-23 months children in the field practice area RHTC Mahatma Gandhi Medical Collage & Hospital Jaipur, was found to be 76.19%. Children with educated father & mother were found to have better immunization coverage. Birth order of child, birth interval with preceding child, and availability of vaccination card were also the major determinants of immunization.

RECOMMENDATIONS

The study highlights that though the immunization coverage in the area is better than the state's average, but a further improvement is possible. The following are the suggestions for improving the immunization coverage in the area

Adequate planning and supervision is required. Efforts should be made to educate the mothers about the importance of immunization by organizing information, education and communication (IEC) activities. The district health authority should conduct frequent outreach camps in underserved areas and give emphasis on immunization of eligible population. Presentation of completely filled Mamta card /Immunization card of the child may be made compulsory at the time of school admission. Pregnancy and child tracking system (PCTS) should be strengthen to remind families about action to be taken for child immunization. The importance of primary immunization under UIP is overshadowed by

repeated Pulse Polio Immunization (PPI) rounds. Many people failed to immunize their children for all VPDs as they considered only OPV as a vaccine. More awareness should be generated among people that there are five other vaccines to be given to their children other than polio vaccine during PPI rounds.

REFERENCES

1. World Health Report [Internet] 2005 [cited 2014 Apr] Available from: <http://www.who.int/whr/2005/en/index.html>
2. National Family health Survey, India. [Internet] Mumbai: International Institute for Population sciences [cited 2015 May].
3. National Family Health Survey (NFHS-3) INDIA 2005-06 RAJASTHAN. Mumbai: International Institute for Population Sciences (IIPS); April 2008. 120 p.
4. District Level Household and Facility Survey [Internet]. Mumbai: International Institute for Population sciences [updated 2010 July; cited May 2015].
5. Park K. Park's Textbook of Preventive and Social Medicine. 23rd ed. Jabalpur: M/s Banarasidas Bhanot Publishers; 2015
6. Kumar V, Sagar V, Karir S, Kumar M. Immunization status among children between 12- 23 months of age attending immunization centre at Rajendra Institute of Medical Sciences, Ranchi, Jharkhand. International J of Healthcare and Biomedical Research. 2015 April; 03(03):61-8
7. Jariwala PD. Study on Identification of Determinants of Childhood Immunization Uptake in the Urban Slum Population of Nadiad city of District Kheda, Gujarat. International Journal in Management and Social Science. 2015 June; 03(06):114-37.
8. Annual health Survey [Internet]. New Delhi: Vital Statistics Division Office of the Registrar General & Census Commissioner, India, New Delhi. [cited 2015 May].
9. District Level Household and Facility Survey [Internet]. Mumbai: International Institute for Population sciences [updated 2010 July; cited May 2015].
10. National Family health Survey, India. [Internet] Mumbai: International Institute for Population sciences [cited 2015 May].
11. Gupta PK, Pore P, Patil U. Evaluation of Immunization Coverage in the Rural Area of Pune, Maharashtra, Using the 30 Cluster Sampling Technique. J Family Med Prim Care. 2013 Jan-Mar; 2(1):50-4.
12. Vohra R, Vohra A, Bhardwaj P, Srivastava JP, Gupta P. Reasons for failure of immunization: A cross-sectional study among 12-23-month-old children of Lucknow, India. Adv Biomed Res. 2013 Jul 30; 2(71):90-95.
13. Sheth JK, Trivedi KN, Mehta JB, Oza UN. Assessment of vaccine coverage by 30 cluster sampling technique in rural Gandhinagar, Gujarat. Natl J of Community Med. 2012 July-Sep; 3(3):496-501.

Table-1 Sex wise Distribution of Children by their Immunization Status

Sex	No.	Fully immunized		Partially immunized		Non immunized	
		(N=160)	%	(N=48)	%	(N=2)	%
Male	121	88	72.7	33	27.3	0	0
Female	89	72	81.0	15	16.8	2	2.2
Total	210	160	76.1	48	22.86	2	0.95

Table-2: Distribution of children according to doses of vaccine (n=210)

Vaccine	Vaccine Given	Percentage	Vaccine not given	Percentage
BCG	208	99.05	2	0.95
OPV Zero Dose	119	56.7	91	43.3
OPV1	203	96.7	7	3.3
OPV2	189	90.0	21	10
OPV3	178	84.80	32	15.2
DPT1	207	98.60	3	1.4
DPT2	195	92.80	15	7.1
DPT3	183	87.10	27	12.9
Measles	168	80.00	42	20
Vitamin A	90	42.90	120	57.1

Table-3:Reasons for Partial and non immunization of the children

Reasons for failure*		Frequency	Percentage
Lack of Information 46 (33.8%)	Unaware of need of immunization	11	8.1
	Unaware of need to return for 2 nd and 3 rd Dose	7	5.1
	Fear of side reactions	27	19.9
	Wrong ideas about immunization	1	0.7
Lack of Motivation by Health worker 50 (36.8%)	Postponed until another time	28	20.6
	No faith in immunization	22	16.2
Obstacles 40 (29.4%)	Time of immunization inconvenient	2	1.5
	Vaccinator absent	1	0.7
	Mother too busy	6	4.4
	Child ill- not brought	27	19.9
	Child ill- brought but not given vaccine	1	0.7
	OPV only considered a vaccine	3	2.2
Total		136	100

*Multiple responses

Table-4: Determinants of immunization status of the child

Characteristics	NO.	Fully Immunized		Partially Immunized		Non Immunized		Chi Square (df), p Value
		160	%	48	%	2	%	
Age (years)								
<20	8	6	75.0	2	25.0	0	0	12.250 (2) 0.002
20-30	168	137	81.5	31	18.5	0	0	
>30	34	17	50.0	15	44.1	2	5.9	
Father's education								
Illiterate	35	14	40.0	20	57.1	1	2.9	32.465 (2) 0.000
Up to high school	82	63	76.8	18	22.0	1	1.2	
Above high school	93	83	89.2	10	10.8	0	0	
Father's occupation								
Unemployed/Unskilled	109	74	67.9	34	31.2	1	0.9	10.148 (2) 0.006
Semiskilled/Skilled	73	64	87.7	8	10.9	1	1.4	
Semi professional/ Professional	28	22	78.6	6	21.4	0	0	
Mother's education								
Illiterate	54	28	51.5	25	46.3	1	1.8	26.393 (2) 0.000
Up to high school	116	102	87.9	13	11.2	1	0.8	
Above high school	40	30	75.0	10	25.0	0	0	
Birth order of the child								
1	68	66	97.1	2	2.9	0	0	49.723 (2)

2	97	77	79.4	20	20.6	0	0	0.000
>3	45	17	37.8	26	57.8	2	4.4	
Birth interval with preceding child								
Not applicable	68	66	97.1	2	2.9	0	0	23.451
<3 years	94	61	64.9	32	34.0	1	1.1	(2)
>3 years	48	33	68.7	14	29.2	1	2.1	0.000
Availability of vaccination Card								
Yes	187	152	81.3	35	18.7	0	0	17.479
No	23	8	34.8	13	56.5	2	8.7	(1)
								0.000