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Immunization Coverage among Children Aged 12-23 Months in Surajgarha Block, Lakhisarai District, Bihar: A Cluster Sampling Survey

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ABSTRACT

Introduction: The DLHS survey has identified that the immunization coverage is less than 50% in Bihar state. This study was carried out to determine immunization coverage rate and to assess factors determining immunization coverage, including factors both affecting provision and utilization of governmental immunization service among children aged 12- 23 months in Surajgarha block, Lakhisarai district, Bihar.

Methodology: The WHO 30 cluster sampling method and the standard WHO questionnaire was used. In each cluster, 7 children have enrolled in this study a total of 210 children. Selection of children in each village was done by the nearest door to door method. Immunization was validated by card. BCG was also validated by the presence of BCG scar.

Result: Full immunization coverage as per card was 30.47% and exclusively by history was 16.7%. Total immunization coverage (as per card and history) was 47.14%. The BCG coverage, DPT coverage, Polio coverage and Measles coverage through card and history was 63.8% and 21.4%; 53.3% and 19.5%; 46.7% and 18.1%; and 48.6% and 18.6% respectively.

Conclusion: The immunization coverage wasvery low in Surajgarha block of Lakhisarai district Bihar. Therefore, need to improve the health services, both from the utilizer side and provider side.

Keywords: Immunization Coverage, WHO Cluster sampling, Gap in Immunization Coverage

INTRODUCTION

The Universal Immunization Program (UIP),[1] a national programme launched in the country since 1985 is aimed at universal coverage of target population with vaccination against six preventable killer diseases - polio, diphtheria, tuberculosis, pertussis (whooping cough), measles and tetanus. Although immunization coverage has improved over the past few decades, the rate of progress is slow. The immunization coverage in India varies by state and area, and by level of urbanization. In general, the rural population has substantially lower coverage than in urban areas. Availability of health infrastructure is a major factor in providing immunization, but the presence of a community health worker in the village is not necessarily associated with increased immunization coverage.[2,3]Vaccination is widely recognized as one of the most powerful and cost-effective public health tools. Often immunization is a child's first - sometimes only - contact with the health system.[4]

In Bihar, the immunization coverage is among the lowest in the country, for a range of reasons. According to the District Level Health Survey in Lakhisarai district[5] carried out "between" 2007-2008, in Lakhisarai district, the immunization coverage is 36.6%. The proportion of fully immunized children was 19% in the Coverage Evaluation Sur-

vey of 2005. In October 2007, a special campaign called Muskaan Ek Abhiyan (The Smile Campaign) was launched under the National Rural Health Mission to give a fillip to the immunization program, and has shown an increase in the levels of coverage.[6,7]

Access to health services and other infrastructure, is associated with better vaccination coverage of infants. Measuring immunization coverage and the factors responsible for low coverage are critical for developing strategies to improve delivery of and access to an important public health tool. Therefore, this study is conducted in Surajgarha block of Lakhisarai district Bihar to determine immunization coverage rates, and evaluate factors influencing immunization coverage.

METHODS

The WHO 30 cluster sampling technique[8]and the WHO standard questionnaire was used to determine the immunization coverage and reason for lack of immunization coverage.

Full immunization is defined as "A child who has received all doses of the standard six antigens – BCG, diphtheria–tetanus– pertussis (DTP) (3 doses), polio (3 doses), and measles vaccines." and partial immunization defined as "A child who has received minimum one dose but not all doses of the standard six antigens – BCG, diphtheria–tetanus– pertussis (DTP) (3 doses), polio (3 doses), and measles vaccines" while non-immunization is defined as "A child who has not received any doses of the standard six antigens – BCG, diphtheria–tetanus– pertussis (DTP) (3 doses), polio (3 doses), and measles vaccines."

The study was conducted in Surajgarha block of Lakhisarai district, Bihar during September 2013 to November 2013. The WHO 30 cluster sampling study design was used to find out immunization coverage and reasons for such poor coverage. In this method[8] first step was to find out geographical area followed by 30 cluster within geographical area. Method of selection of cluster was, divide the total population under geographical area by 30. That number give the cluster interval of study area followed by selection of first house and starting point in each cluster.[9]

After approval from ethics committee the informed consent in the local language (Hindi)was obtained from the parent. All the eligible parents/caregivers were then interviewed using a questionnaire. Immunization coverage was estimated from the card and history separately. The interview lasted for around ten to fifteen minutes for each house.All the children in the age group of 12-23 months who were permanent residents of the village were included in this study. Questionnaires consisted of two sections. The first sections included the participant's details and details about individual vaccine under the EPI schedule. The last section includes the reason for not taking vaccine

Statistics-

Data entry was done in epi-data version 3.1 and analysis was done in statistical package for the social sciences (SPSS) version 16. To find out the immunization coverage and reason for such immunization coverage, various outcomes like proportion of BCG, DPT, OPV and Measles were calculated.

RESULTS

Full immunization coverage of Surajgarha block from table-1 shows that before two years of age as per card and history is 81(38.6%) and 35 (16.7%) respectively. The proportion of children who had at least taken one dose of any vaccine as per card and history is 57 (27.1%) and 11 (5.2%) respectively. The proportion of children who had not taken even a single dose of vaccine either by card or history is 26 (12.4%). Total coverage rate before one year of age is 116 (55.2%). The full immunization coverage rates before one year of age, as per card, are 64 (30.47%) and 35 (16.7%) as per history.

The total immunization coverage rate of Surajgarha block, Lakhisarai district, Bihar is 99 (47.14%). But in this study immunization coverage is validated only by card. So, based on immunized through card, the immunization coverage rate of Surajgarha block, Lakhisarai district, Bihar is 64 (30.47%). 138 children had the immunization card in this study (65.7%) and the number of children who did not have an immunization card in this study were 72 (34.30%).

Immunization coverage rate of BCG vaccine as recorded on the card is 134 (63.8%) and by history is 45 (21.4%). The total immunization coverage based on card and history is 179 (85.2%). Immunization coverage was validated by presence of BCG scar. So, the total immunization coverage rate from table-2 shows BCG vaccine coverage rate is 172 (81.9%).

The immunization coverage rate of DPT 1 vaccine by card and by history is 124 (59%) and 41 (19.5%) respectively. Total immunization coverage rate of DPT1 vaccine is 165 (78.6%). The immunization coverage rate of DPT 2 vaccine by card and by history is 123 (58.6%) and 42 (20%) respectively. Total immunization coverage rate of DPT 2 vaccine is 165 (78.6%). The immunization coverage rate of DPT 3 vaccine by card and by history is 114 (54.3%) and 41 (19.5%) respectively. Total immuni-

zation coverage rate of DPT 3 vaccine is 155 (73.8%) The immunization coverage rate of DPT vaccine from table-2 shows through card and through history is 112 (53.36%) and 41 (19.5%) respectively. Total immunization coverage rate of DPT vaccine (from table-2) either through card or through history is 153 (72.85%).

Table-1 Immunization coverage rate among children under two years of age group

Immunization status (n=210)	By card (%)	By History (%)	Total (%)
Full			
Before One year	64(30.5)	35 (16.7)	99 (47.1)
Before Two years	81(38.6)	35(16.7)	116(55.2)
Partial			
Before two years	57(27.1)	11(5.2)	68(32.4)

Table-2 frequency (by cards) of six preventable vaccines under two years of age group (n=210)

Immunization status	Frequency (%)
BCG	172 (81.9)
DPT	112 (53.36)
OPV	98 (46.7)
Measles	102 (48.6)
Full immunization ≤2years	64 (30.47)
Full immunization ≥2years	81 (38.6)

Table-3 frequency of Reason for non-acceptance of vaccines (n=91)

Reason for non- acceptance	Cases (%)
Unaware of need for immunization	20 (21.98)
Unaware of need to return for 2nd & 3rd dose	4 (4.40)
Fear of side reaction	3 (3.30)
Wrong idea about contraindication	1 (1.10)
No faith in immunization	9 (9.89)
Time of immunization inconvenient	2 (2.20)
Vaccinator absent	2 (2.20)
Vaccine not available	5 (5.49)
Mother too busy	11 (12.09)
Family problem, including illness of mother	3 (3.30)
Child ill-not brought	10 (10.99)
Child ill-brought but not given vaccine	1 (1.10)
Long waiting time	1 (1.10)
Migration	19 (20.88)

The immunization coverage rate of OPV zero dose by card and by history is 88 (41.9%) and 42 (20%) respectively. Total immunization coverage rate of OPV zero dose is 130 (61.9%). The immunization coverage rate of OPV 1 dose by card and by history is 106 (50.5%) and 39 (18.6%) respectively. Total immunization coverage rate of OPV 1 vaccine is 145 (69%). The immunization coverage rate of OPV 2 dose by card and by history is 108 (51.4%) and 39 (18.6%) respectively. Total immunization coverage rate of OPV 2 vaccine is 147 (70%). The immunization coverage rate of OPV 3 dose by card and by history is 105 (50%) and 38 (18.1%) respectively. Total immunization coverage rate of OPV 3 vaccine is 143 (68.1%). The immunization coverage rate of OPV vaccine by card and by history is 98 (46.7%) respectively. Total immunization coverage rate (from table-2) of OPV vaccine is 136 (64. 76%).

The immunization coverage rate of Measles vaccine by card and by history is 102(48.6%) and 39 (18.6%) respectively. Total immunization coverage of Measles vaccine is 141 (67.2%). There are 26 children who have not taken any single dose of vaccine. Frequency of children who got vaccine from hospital, health centre and private/non-government centres are 26 (12.4%), 81 (38.6%), 82 (39%) and 21 (10%) respectively.

The maximum number of source of vaccination is from health centre and least number of sources of vaccination is from private/non-government. There is reduction in immunization status from BCG vaccine towards measles vaccine. Between the OPV and measles vaccine there is slightly increase in immunization coverage. Maximum immunization coverage is for BCG vaccine while least is OPV vaccine. The full immunization coverage before two years is greater than the full immunization coverage before one year of age.

DISCUSSION

According to the DLHS survey -3 the immunization coverage of Bihar was found to be below 50 percent and vary from block to block. The total immunization coverage in this study was 38.6%.A study on Madhya Pradesh showed that "immunization coverage was declined from0.2-17.2% in the last 3 years.[10]This is very low, especially in comparison with immunization coverage from South India. The dropout from immunization coverage is very high from BCG to DPT, which was 81.9% to 53.3%. This indicates the lack of awareness of the need to return for vaccination. There is no education program organized by the providers to motivate the mothers to return for the second and third doses.

The factors contributing towards incomplete immunization include the fact that information on requirement for full immunization is not communicated to the client's receiver in an understandable (local language).Improving mother's knowledge regarding immunization presents potential opportunities to increase the coverage. There is a need to conduct in-depth interviews, observation of sessions and interactions in maternal child health centre to assess whether mothers and caretakers are properly motivated to bring children to maternal child health. Another similar studies conducted on "Lots Quality Coverage Survey Technique for As-

sessment of Determinants of Immunization Coverage in Urban Slum of Mumbai" Shows that reason for less immunization coverage islack of information (21.13%), lack of motivation (13.40%) and Obstacles(65.46%).[11]Theadministration of invalid doses indicates that vaccinators in both the fixed and outreach facilities do not screen children adequately before administering vaccines. This could be investigated by physical observations of EPI sessions, as well as conducting in-depth interviews of mother and follow-up to ensure adherence to immunization schedules. Holding irregular EPI sessions may contribute to the low immunization coverage in Surajgarha block. Significant association was found between the presence or absence of immunization card and chances of getting immunized with significant p value of 0.000.

A total of 138 children who had immunization card 81 children were vaccinated. Out of 81 children 64(79.01%) are immunized before the one of age. There was 172(81.90%) children had BCG scar, so if validation of BCG immunization coverage rate was done by presence of BCG scar than the proportion of BCG vaccination would be 81.90%.The reason for low immunization coverage from user side varies from village to village. 20(9%) out of 210 selected eligible parents were found to be unaware about the need of vaccination. A study was done to assess the immunization coverage in an urban slum area of Mumbai and determine various sociodemographic variables. A total of 210 children were selected from study population using 30 WHO cluster sampling technique. Coverage of BCG was found to be the highest (97.1%) while that of measles was the lowest. The main reason for noncompliance was given as child's illness at the time of scheduled vaccination followed by lack of knowledge regarding importance of immunization. Low education status of mother, high birth order, and place of delivery were found to be associated with low vaccination coverage.[12]Another similar study showed that visit to native place (14.7%), carelessness (lack of time) (11.7%), sickness of child (11.7%), and lack of knowledge (10.4%) were reasons for incomplete immunization.[13] There were various studies done on reason of such immunization coverage in different-different places shows the significant association between immunization status of the children and mother's education status, birth order, and place of delivery.[14,](15),(16)

To insure regular EPI session involvement of Community may be an appropriate means to remedy this situation. A study on "Immunization Coverage in Rural and Urban Field Practice areas of a Medical College of Gujara" showed that "Reasons for missing doses were sickness of child, no felt need, fear of adverse effects following immunization (AEFI), unawareness about session site etc".(17)On one side Health practitioners mostly accept that low demand for, or refusal of immunization, replicates public ignorance or misrepresentation that needs to be changed through education. So far expectations of unawareness and rumours overlook the effect of local knowledge and cultural perspectives on leading people to demand. On the other side, recording and reporting EPI performance are important documentary activities that are vital to performance of the EPI program. Among others, these include issuing mothers with cards, and documenting the EPI register for children of under one year in each immunizing facility. Child Health Cards can help health workers and caretakers to follow up child health issues.(18) A system of tracking down eligible children for routine vaccination will be necessary, as missed opportunities and refusals are crucial in routine programme and future campaigns. All stakeholders should come to a common conclusion regarding formulation and development of alternative strategies, and proper implementation to increase the immunization coverage in Surajgarha block, Lakhisarai district Bihar.

CONCLUSION

Immunization coverage rate is poor than the national coverage rate therefore need to address this issues from provider side as well as user side. Cause for no and partial immunization need to be resolved through different scientific strategies. To increase the immunization coverage, need to continuous monitoring and supervision of immunization site.

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