

Original Research Article

## Utilization of immunization services in a tertiary care center

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**Abstract:** Vaccination is one of the most cost effective specific protections for child survival. Government of India is committed to safeguard all newborns and infants from the common vaccine preventable diseases by immunizing them under the Universal Immunization Programme. The utilization of the services depends on both the service provider and the users. This acceptance of service goes a long way in improving the health status of the children. The study aims to observe the utilization of the immunization services provided in a tertiary care hospital. Hospital-record based desk evaluation of the services provided in the well-baby clinic of Jorhat Medical college Hospital done for a period of one year. Of all the antigens, BCG institutional dose had the highest acceptance (100%). Dropout rate of BCG to Measles-I was 94.8% and that of Pentavalent-1 to Pentavalent-3 was 25.2%. Only 3.2% children were observed to be completely immunized. To reach the WHO recommended levels of immunization, improved awareness generation is mandated so as to improve the acceptance of the services provided.

**Keywords:** Immunization, Well Baby Clinic, UIP, Dropout rate, BCG

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### INTRODUCTION

Immunization is one of the key preventive strategies to ensure survival of the child in developing as well as developed countries. It is figured as the most cost effective intervention introduced by government to decrease the morbidity and mortality of infants and children. Around three million children die of Vaccine Preventable Diseases (VPDs) each year with more number of these children residing in developing countries [1]. Following the successful start under the global Expanded Programme on Immunization (EPI) in the year 1975, Universal Immunization Programme (UIP) was introduced in India in the year 1985 [2,3] which aimed to cover at least 85% of all infants by 1990. However, this goal was not met even after 30 years of launch of this programme and according to Rapid Survey on Children (RSOC), percentage of full immunization was 65.2% in the year 2013-14 [4]. Further, a national socio-demographic goal was set up in the National Population Policy 2000 to achieve universal immunization of children against all vaccine-preventable diseases of the childhood by 2010 [5]. Immunization significantly contributed to reach close to the United Nations' Millennium Development Goal-4

(MDG-4) which aimed at reducing under-five mortality rate by two-thirds by 2015 to which India is a signatory.

There is a substantial risk of outbreak of vaccine-preventable diseases due to increasing urbanization, migration, increasing slums, high density of population, continuous emergence and re-emergence of new pool of infective agents, and poor coverage of primary immunization. The coverage of vaccination in India is far from complete despite the commitment to universal coverage. One of the causes for this low coverage is underutilization of the services and facilities provided to the beneficiaries by the health care centers.

However, one of the studies that was conducted in a tertiary hospitals in north India found out that the reasons for partial immunization or non-immunization was inadequate knowledge about immunization or subsequent dose; belief that vaccine has side-effects; lack of faith in immunization [6]. This can give us a brief idea of why there is underutilization of the immunization services in those parts. A number of previous studies have explored the reasons for non-immunization [7-11] but none has been carried out to see the acceptability of immunization services in apex

level institute of Assam. The acceptability status of immunization services will support the service planning authority to allocate the scarce resources as per actual need of the programme.

In this study an attempt was made to understand the acceptability of immunization services in a tertiary care teaching hospital in Assam.

**Objectives**

To determine the utilization of immunization services in a tertiary care teaching hospital.

**Methods**

**Study Location**

This study was conducted in Well Baby Clinic (WBC) under Pediatrics department, Jorhat Medical College and Hospital (JMCH). The WBC is steered by the department of Community Medicine and Pediatrics department of JMCH in collaboration with district health and family welfare department under Govt. of Assam.

**Study Duration**

Study was carried out over a one year period from 1<sup>st</sup> April 2015 to 31<sup>st</sup> March 2016.

**Study Design**

This was a record based study carried out concerning children aged 0 – 59 months who attended the WBC of Community Medicine/ Pediatrics department of Jorhat Medical College and Hospital, Jorhat. We trained a Health Educator of Community Medicine department to obtain the requisite data for every month for the period of one year. Data were obtained in regard to utilization

of primary immunization services under the National Immunization Schedule (NIS).

**STATISTICAL ANALYSIS**

The data obtained were classified and analyzed statistically by using MS Excel and SPSS-18 trial version. Data were presented as tables, percentages, bar diagram, frequency polygon and pie diagram.

**Ethical Considerations:**

Ethical clearance was obtained from the Institutional Ethics Committee (H) of Jorhat Medical College

**RESULTS**

In the present study a total of 5923 children were registered in WBC for taking different antigens provided under NIS for primary immunization. Among them 3094 (52.24%) were male and 2829 (47.76%) were female (Fig-1). Among the different antigens of primary immunization, institutional dose of BCG/OPV was received by all the registered children (100%). On the other hand birth dose of Hepatitis B was recorded as 2<sup>nd</sup> highest (45.1%). Monthly utilization of immunization services showed a double peak in the month of September-October and in February-March among all the antigens (Table-1). The male children were relatively covered higher in numbers than female. However it was not statistically significant. Interesting finding of our study was that there was a sharp decline of vaccine utilization over the one year period. Total number of children registered for BCG was 5923 while coverage of Penta-III and measles first dose was only 4.9% and 5.2% respectively of the total registered.

**Table 1: Utilization of immunization services in the Well baby clinic of JMC**

| Month     | BCG / OPV   | Birth dose Hep- B | Penta- I / OPV | Penta II + OPV | Penta III + OPV | IPV*       | Measles I  | JE I       | Measles II | JE II      | DPT Booster I + OPV |
|-----------|-------------|-------------------|----------------|----------------|-----------------|------------|------------|------------|------------|------------|---------------------|
| April     | 230         | 57                | 18             | 19             | 7               |            | 16         | 17         | 16         | 16         | 24                  |
| May       | 342         | 63                | 23             | 18             | 9               |            | 13         | 5          | 8          | 15         | 15                  |
| June      | 485         | 149               | 23             | 21             | 15              |            | 21         | 22         | 4          | 19         | 24                  |
| July      | 484         | 204               | 29             | 24             | 25              |            | 24         | 86         | 11         | 86         | 36                  |
| August    | 523         | 260               | 32             | 17             | 12              |            | 28         | 31         | 7          | 28         | 24                  |
| September | 600         | 309               | 27             | 26             | 21              |            | 24         | 24         | 12         | 28         | 22                  |
| October   | 611         | 308               | 28             | 28             | 30              |            | 23         | 23         | 18         | 21         | 21                  |
| November  | 520         | 274               | 48             | 26             | 28              |            | 27         | 27         | 16         | 15         | 15                  |
| December  | 529         | 284               | 37             | 52             | 28              | 11         | 30         | 31         | 17         | 40         | 40                  |
| January   | 414         | 179               | 27             | 34             | 28              | 28         | 20         | 20         | 19         | 33         | 33                  |
| February  | 570         | 248               | 55             | 44             | 51              | 51         | 44         | 44         | 32         | 41         | 41                  |
| March     | 615         | 343               | 46             | 41             | 40              | 40         | 40         | 40         | 27         | 46         | 46                  |
| Total     | 5923 (100%) | 2678 (45.2%)      | 393 (6.6%)     | 350 (5.9%)     | 294 (4.9%)      | 130 (2.1%) | 310 (5.2%) | 370 (6.2%) | 187 (3.1%) | 388 (6.5%) | 341 (5.7%)          |

\*IPV introduced from December 2015

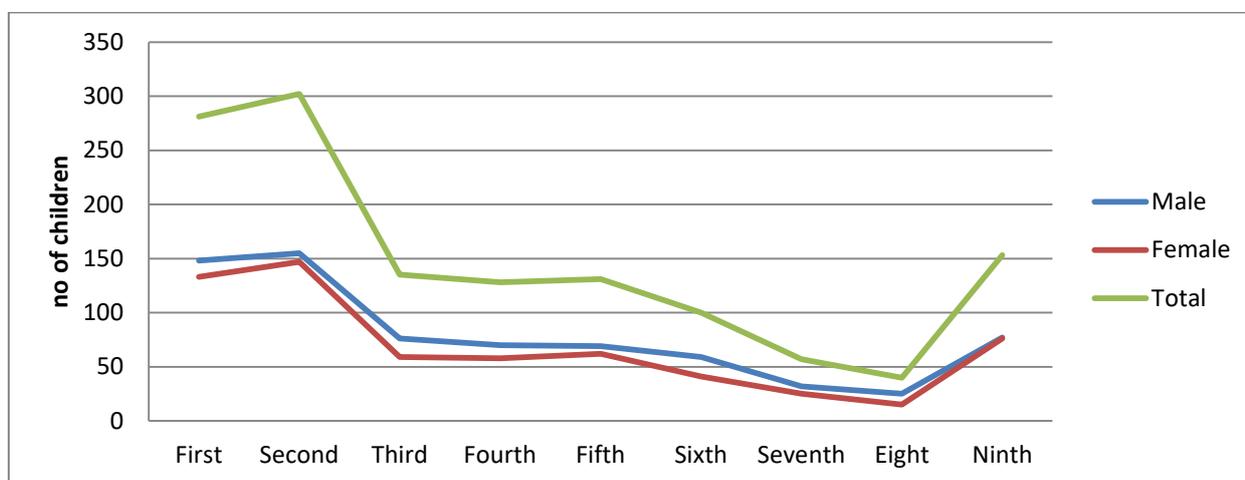
The dropout rate from BCG to Measles (First) dose was very high (94.8%) and from Penta-I to Penta-III was recorded only 25.2%. It has been further observed that utilization of first dose of JE vaccine (6.2%) was little high in comparison to first dose of measles (5.2%) of the registered children. Inactivated Polio Vaccine (IPV) was launched in the month of December 2015 and a total of 130 infants were immunized from December 2015 to March 2015. IPV coverage is equal to third dose of OPV in all these months except in the month of December 2015 where coverage is lower than the third dose of OPV. Of the total children registered only 5.2% children utilized the services of WBC to get

them full immunized and only 3.1% children were vaccinated completely.

We found that the infants who received first dose of measles vaccine (5.2%), of them only 4.7% have received first dose of vitamin-A prophylaxis. However, for second dose of Vitamin-A, care giver of 5.09% children preferred to get their children supplemented. There have been gradual declines in utilization of Vitamin-A supplementation services up to 8th dose (0.67%) except a marginal rise of 3 children in fifth dose. Interestingly there was sudden rise of 9<sup>th</sup> dose of Vitamin-A prophylaxis supplementation up to 153 (2.5%) children (Table-2, Figure-2).

**Table-2: Utilization of immunization services in the well baby clinic of JMCH**

| Doses   | Male | Female | Total      |
|---------|------|--------|------------|
| First   | 148  | 133    | <b>281</b> |
| Second  | 155  | 147    | 302        |
| Third   | 76   | 59     | 135        |
| Fourth  | 70   | 58     | 128        |
| Fifth   | 69   | 62     | 131        |
| Sixth   | 59   | 41     | 100        |
| Seventh | 32   | 25     | 57         |
| Eight   | 25   | 15     | 40         |
| Ninth   | 77   | 76     | 153        |



**Fig 2: Dose wise utilization of Vitamin A prophylaxis**

**DISCUSSION:**

Immunization services were utilized by a total of 5923 beneficiaries in the period of one year, of which 52.23% were male and 47.76% were female. The apparent low numbers of female beneficiaries may be due to the unbalanced sex ratio. The sex ratio of Jorhat district is 956 female per 1000 male (2011 Census). BCG vaccine was found to be utilized by the highest number (100%) of beneficiaries. Being a Tertiary

Health Centre the number of institutional delivery was quite high and all the babies born were provided with the institutional dose of BCG and ‘0’ dose of OPV. The lowest number of BCG immunization was seen in the month of April and the highest was seen in the month of March during our study period. This corroborate with the incidence of institutional delivery.

The number of Hep-B vaccine coverage was found to be 45.2% and it was lower than that of BCG. This

might be due to the probable fact that the new born babies with complications who were admitted in Neonatal Intensive Care Unit (NICU) within 24 hours of birth were not provided with Hep-B vaccine. Moreover, there was irregular supply of Hep-B vaccine during the period.

The number of beneficiary immunized with Penta-1 OPV-1, Penta-2 OPV-2 and Penta-3 OPV3 were 6.6%, 5.9% and 4.9% respectively. The time of vaccination of these vaccines were 1.5 month, 2.5 month and 3.5 months respectively. This can be explained that maximum babies are usually vaccinated in their nearby health centers like sub center, PHC and other neighboring vaccination session sites. So, though delivered in the study site, they did not prefer to return to this tertiary care center again for subsequent vaccinations. We noticed inadequate cross notification of vaccination which was done according to actual place of residence due to weak Mother and Child Tracking System (MCTS).

The newly introduced Inactivated Polio Vaccine (IPV) in NIS was launched in the Jorhat Medical College and Hospital from 16<sup>th</sup> December 2015. Since then a total of 130 IPV vaccines were provided till the end of study period. This reflects the community acceptance of newly introduced IPV vaccine. A total of 5.2% and 3.1% beneficiaries were vaccinated with Measles first dose and second dose respectively. Utilization of both these vaccines was increased in the month of February as compared to previous months. This may be explained that rural people are relatively free due to no cultivation season and hence they get ample time to bring their children to vaccination center.

The utilization of JE first dose was 6.2% and JE second dose was 6.5%, as recorded. The highest JE vaccination was recorded in the month of July. This may be due to increased awareness of people regarding JE transmission season in June-July in this JE endemic district of Assam. Moreover special JE vaccination drive was taken to vaccinate the children during July. A total of 302 (5.09%) beneficiaries received second dose of Vitamin A. The second dose was found to be utilized by the highest number of beneficiaries. But a gradual decrease was observed in the number of beneficiaries utilizing the subsequent doses of Vitamin A, which clearly reflects the complacency on the part of community mobilizer and service users. However, the last dose showed an increase in the number of beneficiaries probably due to the concurrent time of DPT booster vaccine given at 5 years of age.

#### **CONCLUSION:**

From our study we conclude that community acceptance of this tertiary care center is encouraging. To reach the level of WHO recommended 80% utilization immunization services for a rural set up, it needs to be emphasized on awareness building among the health seekers so as to enable the target children get fully vaccinated.

#### **Limitations of the study:**

Because of its tertiary nature, the delivery rate is very high in the facility as a result of the referred cases. This causes a high number of BCG beneficiaries who in the future may not return for the subsequent antigens. So the results obtained in the study reflect those of a tertiary care hospital and not the community. Since the present study is first of its kind we could not compare our findings to any other study.

#### **Acknowledgement**

The authors would like to acknowledge the Head of Department of Pediatrics, Jorhat Medical College and Hospital for his support during the study. We acknowledged vaccine handlers' constant diligent work and regularly updating of data that enabled us to come out with this study. Without which this study wouldn't have been possible. We also acknowledged the PGTs of Community Medicine department who analyzed the data of this paper as a part of their PG training

#### **Conflict of interest**

The authors declare no conflict of interest.

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