Immunization Coverage in Block Hazratbal of District Srinagar, Jammu & Kashmir

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Abstract

Protection through immunization against vaccine preventable diseases, disabilities and death is the right of every child. The impact of the Universal Immunization Programme (UIP) is measured in terms of the vaccine preventable disease (VPD) burden. Inspite of having the immunization programme in place for several decades, the stated goals are not fully achieved. Immunization coverage of an area gives a true picture about the implementation of the immunization programme at the ground level. This study tried to estimate the overall immunization coverage among children aged 12-23 months in block Hazratbal of District Srinagar. A cross-sectional study was carried out in block Hazratbal, Srinagar using a 30 cluster sampling technique. Mothers or caregivers of seven children aged 12-23 months were interviewed from each cluster using a pre-tested WHO proforma, thus giving us the sample size of 210. Out of the total 210 children, 111 (52.98%) were males and 99 (47.02%) were females. 72.38% children were fully immunized against all the vaccine preventable diseases, with 75% of boys and 70.4% of girls fully immunized. Coverage was highest for DPT-3 and OPV-3 (99.04%) and lowest for HBV-3 (74.76%). For BCG, coverage was 96.66% and for Measles it was 96.19%. Coverage figures for all vaccines were higher among males as compared to females. DPT-3 and OPV-3 dropout rate was 1.43% and that for HBV-3 was 15.38%. Thus the immunization coverage in the area was less than 85%, which was primarily due to less coverage of Hepatitis B vaccine.

Keywords: Immunization Coverage, Cluster Sampling, Vaccine preventable disease.

Background and Rationale

Immunization is one of the most effective health interventions known to mankind. Protection through immunization against vaccine preventable diseases, disabilities and death is the right of every child. Important indicators in the Millennium Development Goals for which India is a signatory, include Under-Five Mortality Rate, Infant Mortality Rate, and proportion of one-year-old children immunized against measles. About one-quarter of the under-five mortality is due to vaccine-preventable diseases.1

Universal Immunization Programme was started in India in 1985 with the aim of achieving by the year 1990 at least 85% primary immunization coverage of infants using three doses of Diphtheria, Pertussis, Tetanus (DPT) and Oral Polio Vaccine (OPV), one dose of Bacillus Calmette–Guérin (BCG), and one dose of measles vaccine.2 Hepatitis B vaccine (HBV) has also been included in the Universal Immunization Programme since 2007-2008.

Global Alliance for Vaccines and Immunization is an international network which aims at improving access to sustainable immunization services, expanding the use of all existing safe and cost-effective vaccines. According to the National Population Policy, Universal Immunization of children against all vaccine-preventable diseases should be achieved.3 The impact of this policy is measured in terms of the vaccine preventable disease burden. Over the past years there has been a general decline in the reported number of the six main Vaccine Preventable Diseases. In an evaluation study during 1986-2006, DPT3 coverage was studied based on the reports of coverage surveys from 193 countries. It was found that the coverage of DPT3 increased from 59% in 1986 to 65% in 1990, 70% in 2000, and 74% in 2006.4 Despite the improvement, the stated goals were not fully achieved. Thus, there is an urgent need to address deficiencies in the delivery of immunization services, and to emphasise the need for system strengthening, vigilant monitoring and surveillance.

Vaccination activity should not be an end in itself. To understand the strengths and weakness of the immunization programme and to identify further actions needed to improve the coverage, evaluation of immunization status of the children from time to time is a must. Besides this, evaluation survey also helps to give a true picture of the vaccination status of the target population, which is very often different from the information provided by health workers. It also helps to determine whether the vaccines are given at the right age and outline the factors affecting the programme.

Objectives

The aim of this study was to estimate the overall immunization coverage among children aged 12-23 months in Hazratbal block of Srinagar district of Jammu and Kashmir.

*See End Note for complete author details
Methods

The present cross-sectional study was carried out in Hazratbal block under the field practice area of Government Medical College, Srinagar in the month of September 2013, by a team from the Community Medicine Department. Hazratbal block is predominantly an urban block with small proportions of rural and tribal areas, and is situated 12 kilometers from the city centre. Total population of Hazratbal block as per survey conducted in 2013 is 82721. It comprises of 59 villages, which for administrative purposes are divided into four zones namely Hazratbal, Harwan, Nishat and Tailbal. A total of 12 sub-centres are present in block Hazratbal which provides promotive, preventive and curative services. 122 mohallas (wards) are present in these 12 sub-centres areas. The study subjects included children aged between 12 and 23 months living in the block at the time of the survey.

The study sample included 30 clusters from the entire population of block Hazratbal selected as per the 30 × 7 cluster sampling method, proposed by World Health Organization. Clusters were selected with probability proportionate to population size, by systematic selection based on a sampling frame of the 122 wards. Mothers or caregivers of a total of seven children aged 12-23 months were interviewed from each cluster using a pre-tested, World Health Organization proforma, thus giving a sample size of 210. Although the sampling unit was the individual subject, sampling was conducted at the household level. The subjects were chosen by selecting a household and every eligible subject in the household was included in the sample. Fourteen teams, each comprising of a postgraduate student, three undergraduate students and a healthworker from the Community Medicine Department conducted the survey, under the supervision of faculty members. The training of team members with regard to the method of data collection was done in the department. The team was trained on the appropriate filling of proforma, inspection of scar mark of BCG and source of immunization.

A list of all the 122 mohallas (wards) with their population was procured and arranged in cumulative sequence. A cluster interval of 2757 was obtained by dividing the total population by 30 (No. of clusters). To select the first cluster, a random number less than the cluster interval was generated with the help of random number tables which came out to be 2000. The mohalla having a cumulative frequency equal to or more than 2000, was picked up as the first cluster and subsequent clusters were selected by adding the cluster interval (2757), that is, (2000 + 2757 = 4757). The mohalla having a cumulative frequency equal to or more than 4757 was the second cluster. Thus, in this manner, 30 clusters were selected. Since clusters were selected with probability proportionate to estimated population size, households were selected with approximately equal (but unknown) probability, and all eligible children in a household were selected, the overall probability of any child being selected was roughly equal, and the design was approximately self-weighting (no weighting was needed in the analysis), i.e. each child in Hazratbal had the same chance of being sampled.

A random direction was chosen from the mid-point of every settlement and a dwelling was chosen at random among those along the line from the centre to the edge of the community. Starting from this first household in each cluster, interviewers moved from house to house in a predetermined manner, stopping at every house until a minimum of seven children of the appropriate age were found for each cluster. All children in the household in the age range 12-23 months were included and the mother or caregiver interviewed. In the case of multi-dwelling households, all dwellings were visited. If, at the final house, there were more children than required, they were included in the sample nonetheless.

The child was considered as immunized or not immunized based on information on the immunization card. The child was considered fully immunized if he/she had received one dose of BCG, three doses of DPT, three doses of OPV, three doses of HBV and one dose of measles, and as unimmunized if he/she had received none of these vaccines, and partially immunized if some doses were given, but immunization was not complete. BCG scar was also checked in every child. The 9-month measles immunization was considered to be on time if it was administered between 9 months and 12 months.

Data Analysis

The sample size allows vaccine coverage to be estimated with a 95% confidence interval (±10 percentage points), on the assumption of a design effect (increase in variance due to clustering) of 2. Immunization coverage was calculated using BCG, OPV, measles, DPT and HBV i.e. fully immunized = OPV x 3 + DPT x 3 + HBV x 3 + measles at 9 months.

The study was cleared by ethical committee of Government Medical College, Srinagar.

Results

A total of 650 houses were surveyed for evaluation of primary immunization coverage. A total of 210 children aged 12 to 23 months (to evaluate primary immunization only), were included in the study, of which 111 (52.98%) were males and 99 (47.02%) were females. It was found that 72.38% children were fully immunized against all the vaccine preventable diseases, with 75% of boys and 70.4% of girls fully immunized. Regarding individual vaccine coverage among children, the coverage was highest for DPT-3 and OPV-3 (99.04%) and lowest for HBV-3 (74.76%). BCG coverage was 96.66% and for Measles it was 96.19% (Table 1). Coverage for all the vaccines was higher among males as compared to females. DPT-3 and OPV-3 dropout rate was 1.43% and that for HBV -3
was 15.38%. Nearly 29% of the children received vaccination from Primary Health Centres. Outreach immunization at Sub-centres and anganwadi centres was highest (52.38%). 14.76% received immunization from other government health facilities. The contribution of the private sector in the immunization was only 3.8%.

The World Health Organisation 30-cluster sample survey for estimating immunization coverage among children has been found to be very useful by public health administrators in developing countries, because it is rapid, operationally convenient, and cost-effective. In the present study, overall coverage of immunisation was 72.8% and was more among boys (75%) as compared to girls (70.4%). As per the Coverage Evaluation Survey of 2009, the full immunization coverage in Jammu and Kashmir is 66.6% which is lower than that in the present study, and the coverage in India is 61%. The District Level Household Survey 3 (2007-2008) has shown that full immunization coverage in Jammu and Kashmir was 62.2% and national coverage was 53.5%. One limitation in comparing with District Level Household Survey-3 is that Hepatitis B vaccine (HBV) was not included in its full immunization coverage definition.

Table 1. Immunization coverage by type of vaccine and proportion of children fully immunized

<table>
<thead>
<tr>
<th>Vaccine</th>
<th>Number Immunized</th>
<th>% Immunized</th>
</tr>
</thead>
<tbody>
<tr>
<td>BCG</td>
<td>203</td>
<td>96.66</td>
</tr>
<tr>
<td>DPT-3</td>
<td>208</td>
<td>99.04</td>
</tr>
<tr>
<td>OPV-3</td>
<td>208</td>
<td>99.04</td>
</tr>
<tr>
<td>Measles</td>
<td>202</td>
<td>96.19</td>
</tr>
<tr>
<td>HBV-3</td>
<td>157</td>
<td>74.76</td>
</tr>
<tr>
<td>Fully immunized</td>
<td>152</td>
<td>72.38</td>
</tr>
</tbody>
</table>

The higher coverage of BCG might be because of more institutional deliveries and the study area being near to the city. Similarly, the coverage of OPV3, DPT-3, and measles was also higher than in the National Family Health Survey -3 coverage. Lower coverage rate of HBV-3 (74.8%) has reduced the overall immunization coverage in the block (72.8%). As per Coverage Evaluation Survey 2009, HBV-3 coverage of Jammu and Kashmir was 59.2% (71.9% in urban areas and 55.0% in rural areas). HBV-3 dropout rate was 15.38% which was much more than DPT-3 dropout rate.

Government of India had expanded the Hepatitis B vaccination under UIP in all districts of the 10 good performing States including Jammu and Kashmir in 2007-2008. But since its incorporation in Universal Immunisation Programme, the immunization coverage of Hepatitis B Vaccine has not scaled up proportionately, compared to other vaccines due to different reasons. These include intermittent supply of vaccine at session sites, misconception related to contraindications and reluctance of mothers to accept multiple injections in single site.

Conclusion

To improve the overall immunization coverage to 85%, there is a need for planning at each level, including micro planning at the grassroots level. It can be further improved by introducing Liquid Pentavalent Vaccine which is already in use in many states in the country. Liquid Pentavalent Vaccine can decrease the number of doses and number of injection sites and thus will lead improvement in immunization coverage.

End Note

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Conflict of Interest: None Declared

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