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24 ×7 Bed to Bed immunization of newborn at tertiary care hospital at JLN Medical College Ajmer, Rajasthan – Best Practice

Dr. Renu Bedi*, Dr. Devraj Rao*, Dr. Bharat Meharda*, Dr. Arshiya Bharti**, Dr. Teena Gupta**

**Sr. Prof. & HOD Deptt. of Community Medicine JLN Medical College Ajmer, *First year resident Deptt. of Community Medicine JLN Medical College Ajmer, *Astt. Prof Deptt. of Community Medicine JLN Medical College Ajmer, **Second year resident Deptt. of Community Medicine JLN Medical College Ajmer, **Second year resident Deptt. of Community Medicine JLN Medical College Ajmer*
Corresponding Author: Renu Bedi

Abstract
Introduction
Routine immunization is a key child survival intervention. Accumulated evidences suggest that "Supportive Supervision" improves the quality of health care services.
Aims and Objective-
The present practice aims to cover 100% newborn at tertiary care hospital and improvement of knowledge of Routine Immunization among beneficiaries.
Materials and Methods-
We have initiated 24×7 bed to bed immunizations of all new born as extension of Immunization Services at Tertiary Care Hospital 'Rajkiya Mahilla Chikitslya' JLN Medical College and Hospital Ajmer. This is the best health promoting practice of the deptt. of Community Medicine, JLN Medical College Ajmer.
Our 2-3 first line health worker/public health nurses visit Rajkiya Mahilla Chikitslya to reach out all the new born for the birth dose of OPV-0, HepB-0 and BCG-0.
Results-
We have achieved >95% vaccination coverage of all institutional deliveries thereby contributing towards reduction in neonatal mortality in the district.
Conclusion and Recommendation-
A committed vehicular support, dedicated front line staff, establishing cold chain point at tertiary care hospital, unending availability of vaccines and equipments shall go a long way to achieve 100% coverage of all the institutional deliveries.

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I. Introduction

Immunization is one of the most cost effective specific protection tool and important public health interventions available to promote health. With the implementation of Universal Immunization Program significant achievements have been made in preventing VPDs. Yet, a large proportion of vulnerable infants and children in India are not receiving this intervention.

Across India, National Family Health Survey (NFHS-IV) in 2015-16 showed that only 62 % of children had received all of their primary vaccines by 12 months of age, with a wide variation among states. States with poorer immunization rates generally have higher child mortality rates.

Immunization protects individuals from a specific disease. Vaccines provide active immunity in the body by stimulating the immune system which produces antibodies against the disease producing organisms. There are live attenuated vaccines derived from disease causing viruses or bacteria that have been weakened under laboratory conditions. They replicate in a vaccinated individual, but because they are weak, they cause either no disease or only a mild form. Examples are BCG and Oral Polio vaccines.

There are also inactivated vaccines which are produced by viruses or bacteria and then inactivated with heat or chemicals. They cannot grow in a vaccinated individual and so cannot cause the disease. They are also not as effective as live vaccines, requiring multiple doses for full protection as well as booster doses to maintain immunity. Examples are whole cell vaccines (pertussis); fractional protein based (diphtheria toxoid and tetanus toxoid) and recombinant (hepatitis B) vaccines.

Efficacy of these vaccines varies according to the age at which vaccine is administered and the number of doses given. For example, effectiveness of measles vaccine is 85% when given at the age of 9 months, while three doses of Penta provide over 95% protection against diphtheria, 80% against pertussis and 100% against tetanus, protection by BCG vaccine is up to 80%, effective antibody response is seen in about 95% of vaccines after 3 doses of HepB vaccine in children.

II. Materials And Methods

This is a Cross Sectional Observational Study. We have initiated 24×7 bed to bed immunizations of all new born as extension of Immunization Services at Tertiary Care Hospital 'Rajkiya Mahilla Chikitslya' JLN Medical College and Hospitals which is 10 Km away from main hospital at Ajmer.

Our 2-3 first line health workers/public health nurses, who are well trained in immunization, visit Rajkiya Mahilla Chikitslya to reach out all the new born for the Zero dose of OPV, HepB and BCG. There are total 12 wards, 1 Neonatal ICU, our staff visits all the wards bed to bed on daily basis. Last cold chain point (which receives vaccines from the district vaccine store) is situated at Immunization and anti Rabies clinic JLN Ajmer, from where vaccines are carried in Vaccine Carriers and team commutes by a college pool vehicle made available by the Superintendent of JLN Medical College Hospital. The BCG, OPV and HepB vaccines are packed in paper then kept in polybag inside the vaccine carriers with conditioned ice packs. The disposable syringes 5 ml for the reconstitution of BCG, 0.1 ml AD syringes, 0.5 ml AD syringes, droppers for OPV,

diluents for BCG vaccines, blank Mamta cards, vial opener, dry cotton swabs, gloves, hand sanitizers, immunization register, daily reporting performa is available with the team for extension immunization session.

All the data are being monitored daily by supervisory staff. The reporting is done in a format on daily, weekly and monthly basis. Daily and weekly reports are sent to the Prof. & Head department of Community Medicine JLN Medical College Ajmer and Principal and controller of the institute. All the monthly reports are sent to the Prof. & Head of Department Community Medicine JLN Medical college Ajmer, Principal and Controller of the institute, Reproductive and Child Health Officer Ajmer and record room of the institution.

The practice of supervision with regard to injection practice, cold chain maintenance, indention and supply of vaccines and logistic is closely monitored.

Data Collection-

Data collection tool is the daily immunization register, which is being maintained by the team of immunization and Anti rabies clinic under the department of Community Medicine of JLN Medical College and Hospital Ajmer.

Data Analysis-

Qualitative data was analyzed manually in term of frequency and percentage.

Ethical issues-

As this study does not involve any active process or intervene in any ongoing process it does not pose any risk to the beneficiaries. Hence ethical clearance was not required.

III. Observation and Discussion

Table 1 :- Month wise immunization of the new born at tertiary care hospital 2016

Month	Male	Female	Total deliveries	BCG birth dose		OPV birth dose		HepB birth dose	
					%		%		%
January 2016	554	526	1080	1020	94.44	960	88.88	1020	99.44
February 2016	567	481	1048	1044	99.61	962	91.79	1044	99.61
March 2016	497	531	1028	1000	97.27	1000	97.27	1000	97.27
April 2016	516	464	980	922	94.02	922	94.08	920	93.87
May 2016	565	505	1070	989	92.42	989	92.42	989	92.42
June 2016	589	477	1066	996	93.43	996	93.43	996	93.43
July 2016	647	567	1214	1107	91.18	1107	91.18	1106	91.10
August 2016	690	651	1341	1323	98.65	1323	98.65	1322	98.58
September 2016	707	559	1266	1217	95.73	1217	96.12	1216	96.05
October 2016	676	570	1246	1200	96.30	1200	96.30	1197	92.05
November 2016	671	562	1233	1170	94.89	1170	94.89	1167	94.64
December 2016	572	581	1153	1092	94.70	1092	94.70	1075	93.23
Total	7251	6474	13725	13080	95.30	12938	94.26	13052	95.09

There were total 13725 live births in year 2016, 7251 were male and 6474 female, out of which 13080 were given BCG-0 (95.30%), 12938 (94.26%) were given OPV-0 and 13052 (95.09%) were given HepB-0.

Table 2 :- Month wise immunization of the new born at tertiary care hospital 2017

Month	Male	Female	Total deliveries	BCG birth dose		OPV birth dose		HepB birth dose	
					%		%		%
January 2017	623	583	1206	1138	94.36	1109	91.95	1117	92.62
February 2017	529	500	1029	1000	97.18	1000	97.18	983	95.52
March 2017	567	487	1054	1003	95.16	1003	95.16	997	94.59
April 2017	523	468	991	906	91.42	906	91.42	906	91.42
May 2017	531	542	1073	1025	95.52	1025	95.52	1019	94.96
June 2017	568	519	1087	995	91.53	995	91.53	995	91.53
July 2017	648	624	1272	1154	90.72	1154	90.72	1150	90.40
August 2017	753	749	1502	1374	91.47	1374	91.47	1359	90.47
September 2017	689	655	1344	1311	97.54	1311	97.54	1289	95.90
October 2017	735	701	1436	1334	92.89	1332	92.75	1298	90.38
November 2017	709	693	1402	1299	92.65	1297	92.51	1266	90.29
December 2017	651	642	1293	1200	92.80	1198	92.65	1190	92.03
Total	7526	7163	14689	14039	95.57	13704	93.29	13569	92.37

In year 2017 there were total 14689 live births with 7526, 7163 males and females respectively, 13739 were given BCG-0(95.57%) , 13704 (93.29%) were given OPV-0 and 13569 (92.37%) were vaccinated with HepB-0.

Table 3:- Month wise immunization of the new born at tertiary care hospital 2018

Month	Male	Female	Total deliveries	BCG birth dose		OPV birth dose		HepB birth dose	
					%		%		%
January 2018	652	612	1264	1227	97.07	1225	96.91	1209	95.64
February 2018	556	493	1049	1016	96.85	1010	96.28	989	94.28
March 2018	568	532	1100	1038	94.36	1026	93.27	1000	90.90
April 2018	523	519	1042	978	93.85	977	93.76	952	91.36
May 2018	605	573	1178	1106	93.88	1098	93.20	1085	92.10
June 2018	638	566	1204	1132	94.01	1127	93.60	1118	92.85
July 2018	697	655	1352	1288	95.26	1279	94.60	1247	92.23
August 2018	738	656	1394	1303	93.47	1304	93.54	1268	91.09
September 2018	672	607	1279	1254	98.04	649	50.74	1235	96.55
October 2018	705	642	1347	1323	98.21	797	59.16	1287	95.54
November 2018	640	522	1162	1159	99.74	1151	99.05	1152	99.13
December 2018	646	622	1268	1206	95.11	1204	94.95	858	67.66
Total	7640	6999	14639	14030	95.83	12847	87.75	13400	91.53

In year 2018 from January to December there were 14639 live births at RMC Ajmer. Among them 7640 were male and 6999 females. Out of these 14030 were given BCG-0, 12847 were given 12847 OPV-0 and 13400 were vaccinated with HepB-0. In calendar months of September and October less sessions of OPV-0 were held

due to interrupted vaccine supply, hence monthly percentage of OPV-0 dropped to 50.74% and 59.16% for September and October respectively which is very low to other calendar months of the year 2018. In the month of December the supply of HepB vaccine was interrupted so the percentage came down to 67.66 which is quite low to the other calendar months of same year.

Table 4 :- Year wise immunization of BCG-0 to the new born at tertiary care hospital

Year	Total deliveries	Total immunized with BCG birth dose	Percentage
2016	13725	13080	95.30%
2017	14689	13739	95.57%
2018	14639	14030	95.83%

The comparative study of the data gathered for BCG-0 for the year 2016.2017 and 2018 shows increasing trends from 95.30% to 95.83%.

Table- 5 Year wise immunization of OPV-0 to the new born at tertiary care hospital

Year	Total deliveries	Total immunized with OPV dose	Percentage
2016	13725	12938	94.26%
2017	14689	13704	93.29%
2018	14639	12847	87.75%

In the months of September and October, supply of OPV was withdrawn so fewer sessions were held in both these months so the percentage dropped to 87.75%. If we exclude September and October the percentage for remaining year is 94.90%.

Table-6 Year wise immunization of HepB-0 to the new born at tertiary care hospital

Year	Total deliveries	Total immunized with HepB birth dose	Percentage
2016	13725	13052	95.09%
2017	14689	13569	92.37%
2018	14639	13400	91.53%

In the month of December, HepB vaccine supply was interrupted so fewer sessions were held, so the percentage dropped to 91.53%. If we exclude December the percentage for remaining year comes 93.80%.

We have achieved >95% vaccination coverage of all institutional deliveries thereby contributing towards reduction in neonatal mortality in the district. There were 399, 531 and 513 deaths reported in the year 2016, 2017 and 2018 respectively. These are the deaths after deliveries as per records of Rajkiya Mahilla Chikitsalya JLN Ajmer.

IV. Conclusion and Recommendations

This practice is taken up on daily basis at the tertiary care center of JLN Medical College and hospital to reach all the institutional deliveries.

1- Program management-

Holistic management of the Immunization Supply Chain System including cold chain, vaccine logistics along with human resources is important element. Micro plan is most important tool for successful immunization services. Micro plan includes the duty chart of the frontline workers with name and mobile number of the staff, name of driver of the vehicle, Immunization session activity as per demand estimation of beneficiaries and logistics.

2- - Vaccine availability-

All the three vaccines required at birth are being supplied by Reproductive and Child Health Officer Ajmer to the last cold chain point the immunization and Anti –Rabies clinic under department of Community Medicine JLN Medical College Ajmer in addition to vaccines required for Routine Immunization.

In the year 2016 and 2017 uninterrupted vaccine supply was there and therefore all the vaccine sessions in the calendar months were conducted.

In the year 2018, calendar months of September and October bi-valent OPV was withdrawn, the sessions were interrupted as no interim vaccine was available, and the coverage of OPV-0 dropped to 50.74% and 57.68% respectively. This is quite low in compare to the other calendar months of the same year. HepB vaccine was not available in the month of December 2018 and hence the coverage dumped to 67.60% which is quite low as compare to other months of the same year. There were 399, 531 and 513 deaths reported in the year 2016, 2017 and 2018 respectively. These are the deaths after deliveries as per records of Rajkiya Mahilla Chikitsalya JLN Ajmer.

3- The cold chain for storing and transporting of vaccines is closely monitored. Effective vaccine carriers are being used to transport the vaccines and all vaccines are kept in poly-bags in the vaccine carrier as per guidelines.

4- **Monthly meetings**-
Monthly meetings are held to review the day today immunization, these meetings are held with the medical officer in charge and front line workers to identify problems at the tertiary care center and to provide feedback and suggestions necessary for corrective actions. In order to improve the coverage of beneficiaries. The meetings are also conducted with Reproductive and Child Health Officer Ajmer, Superintendent of Raj. Mahilla Chikitslya JLN Ajmer Principal and Controller JLN Mdical College Ajmer and district collector Ajmer to review and closely monitor the program to improve response of beneficiaries.

5- Supervisionary Visits-
Supervisory visits at the tertiary care center where immunization activities are carried out, are included as per requirement to monitor the immunization services by the Head of Department of Community Medicine JLN Medical college Ajmer, other senior faculty and RCHO Ajmer.

6- Biomedical waste management-
Bio- Medical Waste generated at immunization site is disposed in color coded bags as per bio medical waste management guidelines. The used live vaccines vials are preserved upto 48 hours in Immunization and anti-rabies clinic before discarding.
Immunizing person should remind the beneficiaries to guard their cards carefully and bring them back to next session of routine immunization. A committed vehicular support is mandatory.
Trained and adequate staff
A cold point should be established at the tertiary care center
Uninterrupted availability of vaccines irrespective of wastage factor.
The task is not as easy as it might seem on the surface, since multiple levels of teams are involved. From the level of Principal and Superintendent of JLN, Superintendent of RMC, Prof & HOD dept. of Community Medicine JLN, Support and cooperation of RCHO Ajmer, the front line health workers of Immunization and anti rabies clinic JLN Medical college Ajmer to reach newborn at Rajkiya Mahilla Chikitsalya for bed to bed immunization.
Principal value of our service lies in reaching 100% of all the institutional deliveries.
It is recommended that concept of mobile immunization, should be considered for all the institutional deliveries to fill in the gap and reach 100% of new born children.

References

[1]. Parks Text Book Of Preventive & Social Medicine, K. Park, 24th edition
[2]. Immunization Digest, A. Parthasarthy
[3]. NFHS-4 (2015-16)

Table 1 :- 2018

Month	Male	Female	Total live births	Deaths	Total live birth available for immunization	BCG		OPV-0		HepB	
							%		%		%
January 2018	652	612	1264	51	1213	1227	101.01	1225	100.98	1209	99.67
February 2018	556	493	1049	32	1017	1016	99.90	1010	99.31	989	97.24
March 2018	568	532	1100	49	1051	1038	98.76	1026	97.62	1000	95.14
April 2018	523	519	1042	36	1006	978	97.21	977	97.11	952	94.63
May 2018	605	573	1178	43	1135	1106	97.44	1098	96.74	1085	95.59
June 2018	638	566	1204	45	1159	1132	97.67	1127	97.06	1118	96.46
July 2018	697	655	1352	47	1305	1288	98.69	1279	98.00	1247	96.81
August 2018	738	656	1394	40	1354	1303	96.23	1304	96.30	1268	93.64
September 2018	672	607	1279	54	1225	1254	102.36	649	52.97	1235	100.81
October 2018	705	642	1347	37	1310	1303	99.46	777	59.31	1287	98.24
November 2018	640	522	1162	39	1123	1179	104.98	1171	104.27	1152	102.58
December 2018	646	622	1268	40	1228	1206	98.20	1204	98.04	858	69.86
Total	7640	6999	14639	513	14126	14030	99.32	12847	90.94	13400	94.86

In year 2018 from January to December there were 14639 live births at RMC Ajmer. Among them 7640 were male and 6999 females. They reported neonatal death while were 513. So there were 14126 children were

available for birth dose vaccinations. Out of these 14030 were given BCG-0, 12847 were given 12847 OPV-0 and 13400 were vaccinated with HepB-0.

Table 2 :-

Month	Male	Female	Total live birth	Deaths		BCG		OPV 0		HepB 0	
January 2017	623	583	1206	41	1165	1138	94.36	1109	95.19	1117	95.87
February 2017	529	500	1029	37	992	1000	97.18	1000	100.80	983	99.09
March 2017	567	487	1054	38	1016	1003	95.16	1003	98.72	997	99.40
April 2017	523	468	991	43	948	906	91.42	906	95.56	906	100
May 2017	531	542	1073	46	1027	1025	95.52	1025	99.80	1019	99.41
June 2017	568	519	1087	37	1050	995	91.53	995	94.76	995	100
July 2017	648	624	1272	53	1219	1154	90.72	1154	94.66	1150	99.65
August 2017	753	749	1502	65	1437	1074	71.50	1374	95.61	1359	94.57
September 2017	689	655	1344	51	1293	1311	97.54	1311	101.39	1289	98.32
October 2017	735	701	1436	39	1397	1334	92.89	1332	95.34	1298	97.30
November 2017	709	693	1402	38	1364	1299	92.65	1297	95.08	1266	92.81
December 2017	651	642	1293	43	1350	1200	92.80	1198	88.74	1190	88.14
Total	7526	7163	14689	531	14158	13739	97.04	13704	96.79	13569	95.83

In year 2017 there were total 14689 live births with 7526,7163 males and females respectively. There were total 531 deaths in this year duration. So total children left for birth dose viaccination were 14158 among which 13739 were given BCG-0, 13704 were given OPV-0 and 13569 were vaccinated with HepB-0.

Table 3 :-

Month	Male	Female	Total live birth	Deaths		BCG		OPV 0		HepB	
January 2016	554	526	1080	33	1047	1010	96.46	960	91.69	1010	96.46
February 2016	567	481	1048	30	1018	1054	103.53	962	94.49	1054	103.53
March 2016	497	531	1028	26	1002	1000	99.80	1000	99.80	1000	99.80
April 2016	516	464	980	44	936	922	98.50	922	98.50	920	98.29
May 2016	565	505	1070	31	1039	989	95.18	989	95.18	989	95.18
June 2016	589	477	1066	24	1042	996	95.58	996	95.58	996	95.58
July 2016	647	567	1214	29	1185	1107	93.41	1107	93.41	1106	93.33
August 2016	690	651	1341	36	1305	1323	101.37	1323	101.37	1322	101.30
September 2016	707	559	1266	34	1232	1217	98.78	1217	98.78	1216	98.70
October 2016	676	570	1246	38	1208	1200	99.33	1200	99.33	1197	90.81
November 2016	671	562	1233	30	1203	1170	97.25	1170	97.25	1167	97.00
December 2016	572	581	1153	44	1109	1092	98.46	1092	98.46	1075	96.93
Total	7251	6474	13725	399	13326	13080	98.15	12938	98.91	13052	97.94

There were total 13725 live births in year 2016, 7251 were male and 6474 female. Total number of deaths reported was 399. Total number of children available for vaccination were 13326 out of which 13080 were given BCG-0, 12938 were given OPV-0 and 13052 were given HepB-0.

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