

Original Research Article

Measles rubella campaign: coverage among slum children of Udupi municipality area in Karnataka

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ABSTRACT

Background: Poor coverage of measles vaccine and shift in the age of incidence of rubella towards adolescents and young adults with low rubella vaccination coverage leads to outbreaks of congenital rubella syndrome and measles in India. Therefore the Government of India has decided to administer measles rubella vaccine to all children from 9 months to 15 years of age in campaign mode to eliminate measles and control rubella. The aims and objectives of the study were to assess the coverage of measles rubella vaccination among the slum children of Udupi Municipality area following the MR campaign.

Methods: A community based cross sectional study was conducted for a period of one month among parents of beneficiary children in 312 households of the study population.

Results: Study targeted 350 families in 14 localities of which 312 families were covered consisting 578 children. Amongst them 560 (97%) were immunized and 28 (5%) of them had minor side effects. Fever (89%) was the most common side effect. Among those who were not vaccinated 18 (3%) nearly half of them (44%) were not aware of ongoing campaign and 22% as per physician's advice.

Conclusions: In the present study, coverage of MR vaccine was 97% and 88.1% (275) of the families studied knew about the MR campaign while only 267 (85.6%) actually received the MR vaccine.

Keywords: Measles, Rubella, Measles rubella campaign, Coverage, Slums

INTRODUCTION

India, along with other WHO-SEAR countries, in September 2013, had resolved to eliminate measles and control CRS by 2020.^{1,2} Though the measles vaccine was introduced in the Universal Immunization Schedule since 1985 and the second dose later in the year 2010 it is still difficult to control measles because of its low coverage.^{3,4} In 2015 multiple outbreaks all over India took the lives of nearly 49000 children.⁵ Rubella infection during first trimester of pregnancy in unimmunized women leads to nearly 40,000 cases CRS every year in India.⁶⁻⁸

Therefore Government of India has launched Measles Rubella Vaccination campaign in the country in a phased manner covering all children in the age group of 9 months to 15 years to achieve high population immunity.¹ In Karnataka the first phase of MR vaccination campaign was held during 7th February to 1st March 2017. Children were vaccinated at schools, sub-centres, anganwadis, fixed outreach sessions and mobile posts in villages and urban areas.⁹

Children living in urban slums are always vulnerable to health threats like pneumonia, diarrhoea, measles etc due

to malnutrition and poor environmental conditions, inaccessibility to basic health services and poor immunization coverage.¹⁰

Therefore a study was conducted in urban slums to assess the coverage of the MR vaccination of Udupi Municipality area following the MR campaign.

METHODS

A community based cross sectional study was carried out in the households of the urban slums of Udupi Municipality area for a period of one month (March 2017) following the MR campaign. Udupi Municipality area covers a population of 1, 25,306 covering the geographic area of 69.28 square kilo meter with population density of 287 per square Km. It has a number of health facilities in its vicinity namely, 2000 bedded Kasturba Medical College hospital, District hospital, Maternal and Child Health hospital (400 bedded), 2 Urban Health Centres, 15-20 private hospitals and nursing homes. Apart from that there are a number of Private practitioners of all streams. It is a commendable fact that different kind of health facilities are located within 5-10 Kms.

Inclusion criteria

Any parent/guardian with children of age between 9 months and 15 years, and willing to participate in the study were included in the study.

Exclusion criteria

Parent/guardian with a child of age between 9 months and 15 years not willing to participate in the study or not present even after the second visit were excluded.

Ethical clearance

Approval was obtained from the Institutional Ethics Committee of Kasturba Medical College before the commencement of the study vide letter no. IEC 280/2017.

Sample size

Considering the coverage of second dose of measles vaccine to be 55% in Karnataka (NFHS 4) and non-response rate being 10%, the sample size was calculated using the formula $4pq/d^2$ where p is the coverage of second dose of measles, $q=1-p$ and $d=p \times 0.10$ for 10% relative precision. Thus we got a sample size of 350. We targeted 350 slum households in 14 localities and obtained information from 312 households. Data about the 14 localities of slums with slum households was obtained from the district administration. Thirty eight houses were not included as these houses were locked even at the time of the second visit.

Consent

Written informed consent was obtained from the parents/guardians after assuring them that confidentiality and anonymity of information would be maintained.

Sampling technique

Purposive sampling was employed for the study

Data collection

House to house visit was made and eligible parents and guardians were briefed regarding the purpose of the study. They were interviewed using a predesigned, pretested semi structured questionnaire. Details regarding their socio-demographic characteristics, routine immunization and MR vaccination were asked.

Data analysis

Data was compiled and analyzed in SPSS version 18. Results were expressed in percentages and proportions with 95% confidence interval.

RESULTS

In the present study out of 312 families most of them were Hindus (75.6%). A large proportion of them were residing in nuclear families (62.8%) and were below poverty line (67%). Almost half of the parents had studied upto secondary school (mothers: 54.8%, fathers: 46.2%) Amongst the fathers 43% were unskilled workers whereas 36.9% were skilled workers. Majority of the mothers were homemakers (73.1%) (Table 1).

There were 578 children in these families studied. On interviewing about their routine immunization practices it was found that a bulk of them had their routine immunization cards (81%) and they visited government hospital for their immunization (86.5%) More than three fourth of them had taken all the vaccines as per schedule (78.5%). All of them had received measles containing vaccine but only 23.7% of them had received both measles and MMR vaccine (Table 2).

Majority of the families (88%) had heard about the MR campaign. They had received information mainly from the health workers (50%) and school authorities (43.3%). Around two thirds of them (66%) had received the MR campaign invitation card. Nearly all the children received MR vaccine (97%) and were predominantly in the age group of 1 to 10 years.(75%) Almost equal number of boys (52.3%) and girls (47.7%) had received the vaccine. Majority of them received vaccines in the schools (66%). Thumb marking was present in greater proportion of the children (64%). Among 560 children claimed to have been vaccinated, 93 (16%) of them had neither received the invitation card nor thumb marking. Adverse effects were seen in a very few children (5%). The adverse effects were mainly fever (89.2%) followed by fatigue and dizziness, swelling and pain at the site (Table 3).

Table 1: Socio-demographic details of families.

Socio-demographic details (n=312)	Frequency (%)
Religion	
Hindu	236 (75.6)
Muslim	64 (20.5)
Christian	8 (2.6)
Others	4 (1.3)
Type of family	
Nuclear	196 (62.8)
Joint	70 (22.5)
Three generation	46 (14.7)
Education status of mother	
Illiterate	89 (28.5)
Primary	32 (10.3)
Secondary (5-12)	171 (54.8)
Graduation and above	20 (6.4)
Education status of father	
Illiterate	83 (26.6)
Primary	41 (13.1)
Secondary (5-12)	144 (46.2)
Graduation and above	44 (14.1)
Occupation of father	
Unskilled	135 (43.3)
Semi skilled	36 (11.5)
Skilled	115 (36.9)
Professional and white collar	26 (8.3)
Occupation of mother	
Unskilled	53 (17.0)
Semiskilled	9 (2.9)
Skilled	7 (2.2)
Professional and White collar	15 (4.8)
Homemaker	228 (73.1)
Socio economic status	
APL	54 (17.3)
BPL	208 (66.7)
No card	50 (16.0)

Table 2: Routine immunization practices.

Routine immunization practices	Frequency (%)
Routine immunization card (N=578)	
Present	467 (80.8)
Absent	111 (19.2)
Source of routine vaccination (n=578)	
Government	500 (86.5)
Private	78 (13.5)
Vaccination status (n=578)	
Complete	454 (78.5)
Partial	68 (11.8)
Don't know	56 (9.7)
Received measles, MMR or both during routine immunization (n=578)	
Measles	375 (64.9)
MMR	66 (11.4)
Both	137 (23.7)

Table 3: Source and utilization of MR vaccination.

Source and utilization	Frequency(%)
Awareness about MR campaign (n=312)	
Yes	275 (88.1)
No	37 (11.9)
Source of information (n=275)	
Health care worker	137 (49.8)
Doctor	10 (3.6)
School	119 (43.3)
Mass media	7 (2.54)
Family member	1(0.36)
Government hospital	1 (0.36)
MR campaign invitation card (n=312)	
Yes	205 (65.7)
No	107 (34.3)
Received MR vaccination (n=578)	
Yes	560(97)
No	18 (3)
Received vaccine during campaign age-wise (n=560)	
<1 year	39 (7)
1-5 years	233 (41.6)
6-10 years	185 (33)
11-15 years	103 (18.4)
Received MR vaccination Gender wise (n=560)	
Male	293 (52.3)
Female	267 (47.7)
Source of MR Vaccination (n=560)	
School	368 (65.7)
Government health Facility	179 (32)
Outreach camps	9 (1.7)
Private health facility	4 (0.7)
Number of children who received MR vaccine and have been marked on left thumb (n=560)	
Mark present	359 (64%)
Mark absent	201 (36%)
Number of children who claimed to have received the MR vaccine and have either thumb marking or invitation card (n=560)	
Yes	467 (84%)
No	93 (16%)
Adverse effects (n=560)	
Present	28 (5)
Absent	532 (95)
Type of adverse effects (n=28)	
Fever	25 (89.2)
Fatigue and dizziness	1 (3.8)
Swelling	1 (3.8)
Fever and pain at site	1 (3.8)

Only 18 (3%) of children were not vaccinated which is a large number. When asked for the reasons for not vaccinating almost half of them were not aware about the vaccine (44.4%) whereas the other half did not take the vaccine due to illness in the child (22.2%), as advised by

the doctor (17%) and some were out of station (17%) (Figure 1).

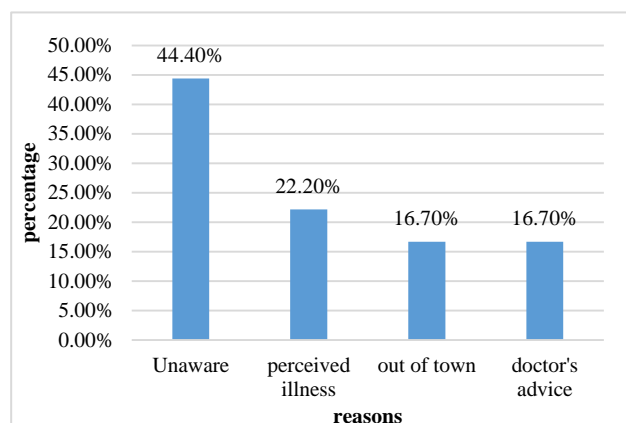


Figure 1: Reasons for not vaccinating the child with MR vaccine.

DISCUSSION

As a part of universal mission of accomplishing universal health coverage, the focus of policy makers and other stakeholders from the South-East Asia Region is dedicated towards achieving the elimination of measles and control of rubella by the year 2020.¹¹⁻¹³ To attain this, they have embraced a four-pronged strategy consisting of achieving and sustaining at least 95% coverage of measles-rubella vaccine with consolidation of supportive services.^{11,13}

Measles is a childhood killer which has been challenging to control because of poor vaccine coverage, high vulnerability of infants to wild measles virus and high case fatality rate. This has foiled India's plans of rising the age of first dose of measles vaccine from 9 months to 1 year.^{3,14,15} Early immunisation at less than one year of age hampers the antibody levels achieved after a second dose of the vaccine leading in poor seroprotection of 80-94% as compared to 95% when given after one year of age. All this has given rise to numerous outbreaks due to poor vaccine efficacy ranging from 66% to 84%.^{3,15-17}

Rubella can turn out to be a matter of public health importance once infection occurs in the first trimester of pregnancy resulting in miscarriage or development of CRS in the foetus. The WHO has estimated incidence of CRS to be between 0.5–2.2/1000 live births during epidemics in developing countries.^{13,18}

Adolescent women must be safeguarded with rubella vaccine before child bearing to prevent her from contracting the disease during pregnancy thereby protecting the child from getting congenital rubella syndrome. Moreover, the additional vaccine dose offers surplus protection to all children.¹⁹

Therefore Government of India launched measles rubella vaccination campaign on February 6, 2017 in the country in a phased manner. It is the greatest ever campaign aiming at about 41 crore children across India. All children aged between 9 months to 15 years are being administered with a single dose of MR vaccine, regardless of their former vaccination status. This was the first time when rubella containing vaccine was included as it would piggy-back on the measles vaccination with negligible extra cost. Karnataka was selected in the first phase of the campaign.^{3,13,20}

In the present study, out of 312 families covered only 275 families (88%) were aware about the MR campaign. These families had received information from the health workers (50%), school authorities (43.3%) and mass media (2.6%). Similarly, these were the key elements used to spread information and mobilize children in Myanmar and Egypt.^{19,21}

A good coverage of 97% was found in the slum area studied where the coverage is usually expected to be poor. During the same phase of MR campaign completed in the states namely Tamil Nadu, Karnataka, Goa, Lakshwadeep and Puducherry the coverage was reported to be 97%.²¹ This outsized the number as compared to United Kingdom (90%), New Zealand (56-85%), Hong Kong (77%), Myanmar (93%), Georgia (50%) and Bangladesh (90%) in their campaign among general population. A similar coverage was observed in Egypt (97.1%). Whereas a higher proportion of coverage was seen in Bhutan (98.17%), Albania (99%) and Iran (100%).^{7,13,19,21,23,24}

It was observed that majority of the children who received vaccine (75%) were in the age group of one to ten years. Whereas in a study conducted by Uddin et al in Bangladesh the coverage was more (74%) in children in the age group of 5-14 years. In a study conducted by Chuang et al at Hong Kong showed a very high coverage (90%) among children in the age group of 6-11 years.^{7,13}

The study observed not much gender bias the vaccine recipients (boys: 52.3%, girls: 47.7%) had received the vaccine which is analogous to the coverage observed by Sayed El, et al at Egpt. (boys: 50.9%, girls: 49.1%). However a study conducted by Uddin et al in Bangladesh showed relatively more vaccine coverage among girls (90.3%) as compared to boys (88%).^{7,21}

Among the study subjects a greater proportion had received vaccines in the schools (66%). Analogous findings were observed by Uddin et al at Bangladesh (75%). Similarly children from United Kingdom, New Zealand, Bhutan, Myanmar also received vaccine in their schools round two thirds of families (66%) had received the MR campaign invitation card which was a crucial advocacy tool requesting parents to send their children to get vaccinated.^{3,12,15} Similar approach was seen in Myanmar where 20 million invitation cards were

distributed to the parents seeking their permission to vaccinate their children. On the contrary a study conducted by Uddin et al at Bangladesh showed that invitation cards were not given prior to the campaign which was a major drawback as it was difficult to ascertain whether the child was vaccinated or not.^{7,19}

Most of the children had thumb markings (64%). This helped us in verifying whether the child had received the vaccine or not. A conflicting finding was seen in a study conducted by Uddin et al at Bangladesh. They conducted the study 4 months after the campaign so lack of thumb marking created recall bias which was a major drawback in the study.⁷

Adverse effects were seen in 28 children (5%) namely fever (89.2%) followed by fatigue and dizziness, swelling and pain at the site. Whereas in Myanmar four major adverse events following immunization were recorded during the campaign. In Bhutan, almost half of the participants (55%) complained of headache, fever and body ache followed by pain at the site of injection, nausea and joint pain. In Egypt 6 serious AEFI cases were reported namely Stevens-Johnson syndrome, anaphylaxis, seizure and encephalitis.^{13,19,21}

In our study 18 (3%) of children were not vaccinated. When asked for the reasons for not vaccinating almost half of them were not aware about the vaccine (44.4%) whereas the other half did not take the vaccine due to perceived illness in the child (22.2%), as advised by the doctor (16.7%) and some were out of town (16.7%). Whereas a study conducted by Uddin et al at Bangladesh reported that 10% of the children were not vaccinated the main reasons being sickness of child (30.52%) and fear of side effects (31.96%).⁷

CONCLUSION

The study concludes that MR vaccination coverage is very good. However nearly 93 (16%) claimed to have received MR vaccine neither had finger mark present at the time of coverage nor possessing the invitation card marked. Therefore investigators had to merely believe parent's words for coverage assessment which was a limitation. 5% of the children manifested with one or the other adverse events following immunization. Therefore in addition to the campaign there is a need for continued surveillance as well as monitoring and interventions for adverse events following immunization for garnering community confidence, their active participation and support towards the campaign. Government of India should capitalize on previous investments for polio eradication by retooling existing information system and resources for measles elimination. Measles surveillance data should be continued to be used to identify any areas with children missed by vaccination, identify and rectify the programmatic errors thereby contributing to the measles and rubella elimination and control effort.

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