

ORIGINAL ARTICLE

AN INVESTIGATION ON MEASLES OUT BREAK IN NAVAGAM VILLAGE OF SURENDRANAGAR DISTRICT OF GUJARAT, INDIA IN 2008

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ABSTRACT

Background: An outbreak of measles was reported from a Navagam village of Surendranagar District, Gujarat, in July 2008. The present study was conducted to investigate and assess various epidemiological features associated with measles outbreak.

Methods: A community based cohort study was carried out in Navagam village of Surendranagar district during month of June 2008. Suspected cases were detected through active case finding in the community. Children <15 years of age with symptoms of Fever and rash and cough or coryza or conjunctivitis (Red eye) in Navagam area of Kharaghoda PHC, Surendranagar district from 1st June, 2008 to 1st August, 2008 were identified as case in present outbreak. Blood samples were taken for IgM antibody detection.

Results: The study covered 326 houses having 777 children. An overall attack rate 11.17% was almost equal in both male & female. Among measles cases, 45 (49.45%) had post measles complications. As much as 69.23% children with measles had received measles vaccination in the past. Out of 11 blood samples, 10 were positive for IgM antibody.

Conclusions: The outbreaks occurred due to poor vaccine coverage levels and an inefficient surveillance system which failed to generate early warning signals.

Keywords: measles outbreak, measles vaccination, measles

INTRODUCTION

Measles is an acute, highly infectious disease of childhood, characterized by fever, catarrhal symptoms and typical rash¹. World Health Organization (WHO) has reported 31 million cases and 7.77 lakh deaths in the year 2000². Despite the availability of a safe and effective vaccine, globally measles killed over 530,000 and 182,000 in South East Asian region as reported in 2003³. Outbreaks of measles in a community tend to occur once the proportion of susceptible reaches 40%⁴. In 2008, there were 2,81,972 reported cases and 164 000 measles deaths globally – nearly 450 deaths every day or 18 deaths every hour. Most measles-related deaths are caused by complications associated

with the disease. Complications are more common in children under the age of five, or adults over the age of 20. The most serious complications of measles infection reported from India include: severe diarrhea, otitis media, bronchitis, pneumonia, meningo-encephalitis, acute exacerbation of malnutrition, blindness and subacute sclerosing panencephalitis. Infants and young children, especially those that are malnourished, are at highest risk of dying from measles. A review of community based studies of published measles outbreak investigations found a median case fatality ratio of 3.7%, range 0 to 23.9%⁵.

Measles morbidity As high as 10% of measles cases result in death among populations with

high levels of malnutrition and a lack of adequate health care. More than 20 million people are affected by measles each year. The overwhelming majority (more than 95%) of measles deaths occurs in countries with low per capita incomes and weak health infrastructures. There for the fourth Millennium Development Goal (MDG 4) aims to reduce the under-five mortality rate by two-thirds between 1990 and 2015. Recognizing the potential of measles vaccination to reduce child mortality, and given that measles vaccination coverage can be considered a marker of access to child health services, routine measles vaccination coverage has been selected as an indicator of progress towards achieving MDG 4⁶. Measles is an important cause of morbidity and mortality among the children of India with a median case fatality rate of 2.5%². The primary reason for this high disease burden is inadequate vaccination coverage due to under-utilization of measles vaccine and weak immunization. Services in many parts of the country. This is unacceptable, because measles vaccine is highly effective, safe, and cost-effective⁵.

BACKGROUND

On 29th July, 2008, one of the medical officers of Patdi block, Surendranagar district, Gujarat informed about cluster of measles cases in Khara Ghoda village of Khara Ghoda PHC, Surendranagar district, Gujarat. 36 cases of measles were reported from Khara Ghoda village. No children were reported to have died from the disease. On 30th July, 2008, a team from B. J. Medical College, Ahmedabad initiated the investigation. This study was undertaken to investigate the extent of the problem, possible factors responsible for its occurrence and for recommending control and preventive measures.

MATERIALS AND METHODS

Khara Ghoda PHC of the Patadi block (Surendranagar district) situated at 67 KM away from the Surendranagar with population of 29,914. Khara Ghoda. The block has the population of 1, 68,062. Vaccination coverage of overall Patadi block was reported 70% in 2007-2008. No previous year coverage data of measles vaccination for the PHC was available.

A cross sectional survey was carried out during the month of June-Aug, 2008 by the team from the department of community medicine. The team comprised of tutors and resident doctors from the same department and paramedical staff of kharaghoda PHC. The village is comprised of 3 hamlets; Cases were reported from Navagam hamlet of kharaghoda village. There were usually 5 to 10 cases reported each year in the Patdi block .36 cases were reported from 3 villages of Kharaghoda PHC which was clearly in excess that indicated existence of epidemic.

The standard case definition was used for diagnosis of measles. A combination of major and minor criteria was used to clinically identify the measles cases.

Major criteria: Fever, Rashes

Minor criteria: Presence of cough, or coryza, or conjunctivitis

A study subject was considered to have measles if he presented with major criteria and any of the three minor criteria. Children <15 years of age with symptoms of Fever and rash and cough or coryza or conjunctivitis (Red eye) from 1st June, 2008 to 1st August, 2008 were identified as case in present outbreak. We searched for the cases by house to house visit. Inquiries about measles cases were made from the mothers or responsible persons. Inform oral consent was taken of interviewee before initiation of the survey.

We collected information about measles vaccination, previous history of measles and any complication of measles and outcome of cases. Immunization status was assessed by checking the cards where available or by a convincing history of immunization given by the mothers. "Unknown" was used to designate patients with no knowledge of their immunization status. Any episode of diarrhea, pneumonia, ear infection (dummy for Otitis media) like complication asked

Blood samples were collected from 11 case patients 4 to 28 days after rash onset. Samples were sent to microbiology laboratory of B. J. Medical College, Ahmedabad on 1st August, 2008 for detection of IgM antibody for measles virus. Data was analyzed in the epi info version 4.1software. We described the outbreak through time, place and person. Depend upon the findings we made hypothesis.

RESULTS & DISCUSSION

11 blood samples were sent to microbiology department of B.J. Medical College, Ahmedabad on 1st August, 2008 for IgM antibody for measles virus. Out of 11 samples, 10 samples were positive for IgM antibody. The other cases were confirmed by epidemiological linkage. We had surveyed 326 houses covering 809 children below 15 years of age. Children were

equally distributed in age group of 37 months to 144 months(22 to 23%) followed by 17.26% in age group 10 months to 36 months. 55.75% children were male and 44.25% female. The outbreak at Kharaghoda village had commenced in the first week of June, 2008, reached a peak in the third week of July and ended gradually in the first week of August. (**Figure 1**)

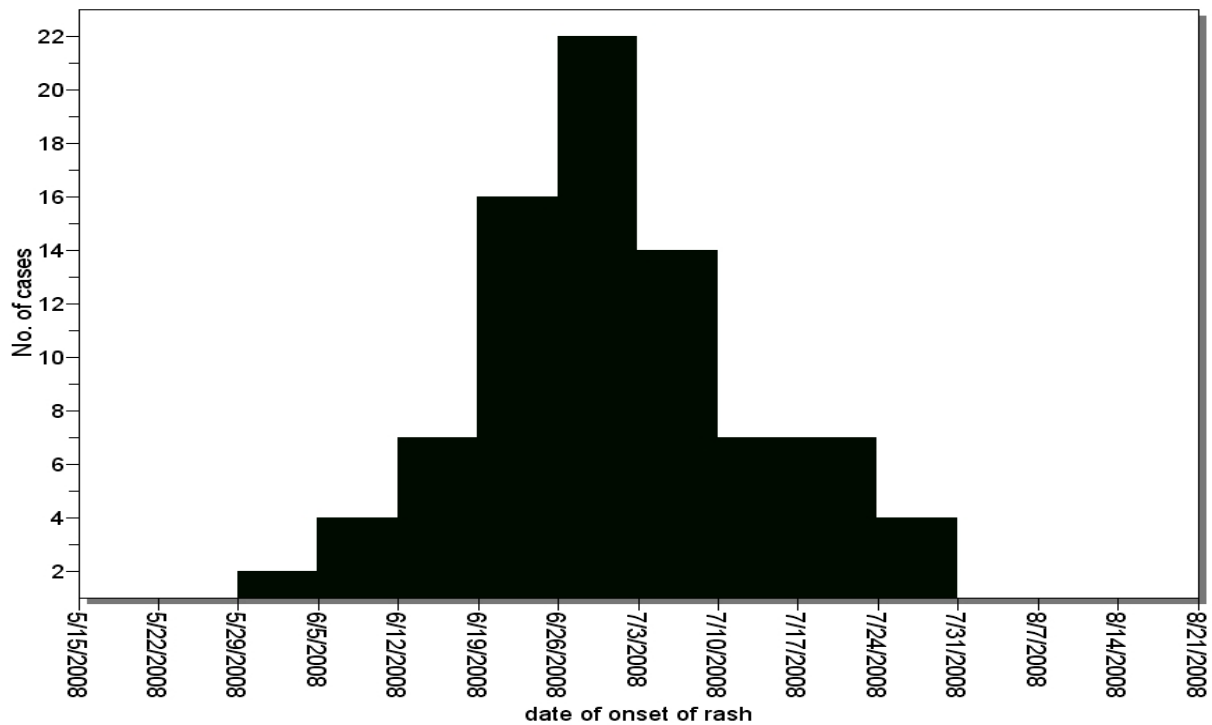


Figure 1: Epidemic curve of measles outbreak in Navagam area, Kharaghoda PHC, Surendranagar district, Gujarat, India, June-August, 2008

Table 1: Attack rate of measles by Age and Sex, Navagam, Kharaghoda PHC, Surendranagar district, Gujarat, India, June-August, 2008

Variable	No of Cases	Population (%)	Attack rate (%)
Age groups (In months)			
0-9	2	35(4.33)	5.71
10-36	21	145(17.92)	14.48
37-72	26	183(22.62)	14.20
73-108	27	186(22.99)	14.51
109-144	11	177(21.88)	6.2
145-180	5	83(10.26)	6.02
Sex			
Male	50	451(55.75)	11.09(0.86p)
Female	42	358(44.25)	11.73(0.03x)
Total	92	809(100)	11.37

We identified 92 cases and no death with overall attack rate of 11.37%. Attack rate was similar for the age group 10 months to 108 months (14% to 15%). 6% attack rate was found in the children less than 9 months and more than 108 months. Attack rate was almost same between both the sexes with no statistical significance. (**Table 1**) Attack rate of measles was 9.22% amongst vaccinated (**Table 2**). Vaccine efficacy was turnout to be 45%.

CONCLUSION

A measles outbreak affected Navagam hamlet. The most likely cause was low vaccine coverage and low vaccine efficacy. The study highlights the urgent need to raise the vaccine coverage levels rapidly in all districts to achieve measles control and prevent future outbreaks in UP.

Table 2: Attack rate of measles by vaccination status in children from 9-180 months of age, Navagam, Kharaghoda PHC, Surendranagar district, Gujarat, India, June-August, 2008

Vaccine Given	Measles	Total	Attack Rate (%)
Yes	49	531	9.22
No	51	243	16.87
Total	90	774	11.62

$\chi^2 = 9.48, P = 0.002$

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