

An Outbreak of Rubella in Chandigarh, India

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Received: July 23, 2013;

Initial review: August 19, 2013;

Accepted: September 15, 2014.

Objective: To investigate an outbreak of fever with rash in an urbanized village in Chandigarh, India.

Methods: Active case search was performed by house-to-house survey. The etiological agent of the outbreak was confirmed by serology. Spot map was done using Geographical Information System (GIS) technology.

Results: Out of 7742 persons screened, 12 were serologically confirmed rubella cases and 83 were epidemiologically linked cases. Overall attack rate was 1.1, more among the age group 1-4 years (4.9).

Conclusion: An outbreak mimicking measles was investigated only to be confirmed as rubella.

Keywords: *Epidemiology, Outbreak investigation, Rubella.*

Large-scale rubella vaccination during the past decade has practically eliminated rubella and congenital rubella syndrome (CRS) in many developed and some developing countries [1,2]. About 131 of the 194 WHO member States introduced rubella-containing vaccines (RCVs) in their routine immunization programmes along with measles and/or mumps by 2010 [1]. In India, there is a lack of comprehensive evidence about the true burden of rubella and CRS [2]. Setting up of reliable surveillance system for understanding local rubella epidemiology can provide such information. The present study was done to investigate an outbreak of exanthematous illness to document local descriptive epidemiology and to control the outbreak.

METHODS

In fourth week of May 2012, a four-year-old girl from an urbanized village, Burail in Chandigarh [3], reported to the health center in the field practice area of School of Public Health, PGIMER, with the complaints of fever and rash meeting the clinical description of measles [4]. Based on the details given by the index case, a team of two postgraduate resident doctors (each from School of Public Health and Department of Virology) from PGIMER, Chandigarh, visited the area with the aim to confirm and investigate the measles outbreak. Initial line listing of ten cases of febrile rash was done by rapid inquiry in neighbourhood houses of index case and in the nearby *anganwadis*. Blood samples were collected from

thirty nine cases after informed consent of parents for serological testing. All the blood samples collected were found to be negative for measles IgM by ELISA (Novatech, Germany). These were then tested for rubella IgM antibodies by ELISA (Dialab, Italy) and twelve turned out to be positive. Thus, suspected measles outbreak turned out to be a confirmed rubella outbreak. House-to-house survey was done to investigate the outbreak further.

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World Health Organization (WHO) definition of suspected rubella case of 'occurrence of fever with maculopapular rash, with or without cervical, sub occipital or post auricular adenopathy or arthralgia / arthritis in any patient of any age' was used [4,5]. Active case search was started from mid-June 2012 and extended till the end of first week of July 2012. It was stopped when no case was reported for three consecutive days. The passive surveillance was continued for another three weeks. Cases were mapped using Geographical Information System technology. The data were analysed by using Epi-info 7. Epidemiological analysis included time, place and person analysis. This investigation was done in the context of public health response to an outbreak. Therefore, retrospective approval was obtained from the Institute Ethics Committee.

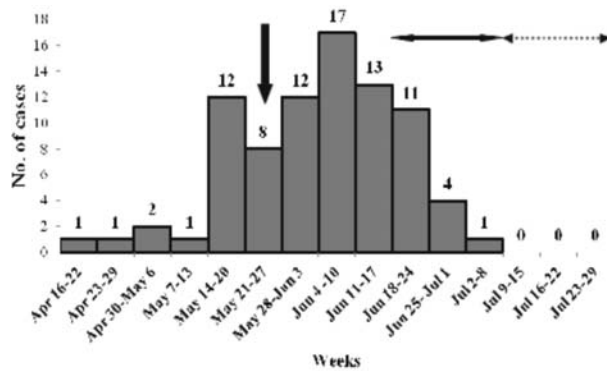


FIG.1 Epidemic curve of rubella outbreak by time of onset of rash in Burail village, Chandigarh. Vertical arrow indicates week of reporting of index case. Horizontal arrow (solid) indicates period of active case finding and horizontal arrow (dotted) indicates period of passive case finding.

RESULTS

A total of 7742 persons were contacted during the house-to-house survey and 83 cases were identified. Epidemic curve is given in **Fig. 1**. The overall attack rate (AR) was 83/7742 (1.1%), and was higher in the age-group of 1-4 years. No complication or mortality was reported. There was one pregnant ante-natal woman among cases. Out of 83 cases, 31 cases (37.3%) were immunized against measles. Among unimmunized cases, 20 (57.1%) cases were in age group of 1-4 years. Five cases (6%) had received MMR from private clinic. None of the adolescent case had history of rubella immunization.

DISCUSSION

In this study, an outbreak of fever with rash in an urbanized village in Chandigarh was investigated. It was confirmed as rubella that affected all age groups and had higher AR among children aged 1-4 years. One pregnant woman was found to be affected; on follow up she had a normal pregnancy outcome.

Limitation of this investigation could be incomplete coverage of the study area, as 20% population is migratory and 10% work as labourers during day hours as per the annual health survey report 2011-12, Burail. However, locked houses were visited at least three times before excluding from the survey.

Compared to results of rubella outbreak in Himachal Pradesh in 2006 where adolescents were mainly affected, children less than 10 years were affected in this outbreak [6]. Low attack rate, no complication and no mortality reiterates the mild nature of the disease as mentioned in other studies [6-9]. About 57% of the cases in 1-4 years age group were not immunized against measles in the study area. This is because of floating nature of the population in this area. However it is an important indicator for consideration before introducing RCVs. Inadequate vaccine coverage may decrease rubella virus circulation in children sufficiently with the resultant upward shift of the median age at infection, thus leading to higher proportion of girls remaining susceptible up to adulthood leading to a paradoxical increase in the number of rubella infections and also in the number of cases of Congenital Rubella Syndrome [10]. Prevailing cultural and religious beliefs regarding febrile rashes in the community prevent people from bringing their children to hospital. Hence these disease are less likely to get reported unless strong surveillance system and sensitization of the community is in place. Moreover, behaviour of the people to visit local practitioners for minor ailments might delay the identification of outbreak. In order to prevent and control such outbreaks in future, it is essential to strengthen the existing disease surveillance system.

Contributors: KM and NS: Data collection, drafting manuscript; MG: Intellectual inputs to manuscript; MPS: Laboratory investigations, Intellectual inputs to manuscript; RKR: Intellectual inputs to manuscript.

Funding: School of Public Health, PGIMER, Chandigarh; *Competing interests:* None stated.

TABLE I DISTRIBUTION AND ATTACK RATE OF THE CASES BY AGE GROUP AND Sex

Age (years)	Female			Male			Total		
	Cases	Total	Attack rate	Cases	Total	Attack rate	Cases	Total	Attack rate
0-1	3	108	2.8	3	131	2.3	6	239	2.5
1-4	16	324	4.9	19	391	4.9	35	715	4.9
5-9	15	400	3.8	6	481	1.2	21	881	2.4
10-14	5	398	1.3	2	480	0.4	7	878	0.8
≥ 15	8	2281	0.4	6	2748	0.2	14	5029	0.3
Total	47	3511	1.3	36	4231	0.9	83	7742	1.1

WHAT THIS STUDY ADDS?

- Rubella has the potential to cause outbreak in the community that are often missed or considered to be due to measles unless there is strong surveillance system.

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