

Original Article:**An outbreak investigation of suspected Chikungunya fever in Nalgonda District, Telangana state****Suguna Dumpala, Nagaraj Kondagunta, Varun Mohan Malhotra, Guru Prasad Venna, Kishore Yadav Jothula***Department of Community Medicine, Kamineni Institute of Medical sciences, Nalgonda*

ABSTRACT

Background: An outbreak of fever with joint pains occurred at Proddutur village, Nalgonda District, Telangana state, India.

Methods: We investigated the out-break; attempted to identify the agent, source, mode of disease transmission, study clinico-epidemiological factors and recommend control measures during the period 11th-15th, February 2014. A rapid fever survey was conducted by using pre-tested, pre-designed epidemiological case sheets. Seventeen serum samples were collected for laboratory analysis. Entomological survey was conducted to identify and study the vectors.

Results: The outbreak was observed to be a seasonal disease which started on 12th January, 2014 and continued till 18th February, 2014. Out of the total population of 1365 in the village, 259 cases were identified to have chikungunya fever as per case definition. Overall attack rate was 19%. Maximum cases occurred (24.1%) in the age group of 21-30 years and the least (1.9%) in the age group of less than one year and greater than 70 years (2.8%). Proportion of cases of Chikungunya was higher in females (51.9%) compared with males (48.2%). Fever (100%) and Joint pains (92.6%) were the most common clinical manifestations; 61% had severe disability and needed family help to do daily normal activities. Out of seventeen serum samples sent for laboratory confirmation, 5, 2 and 2 were positive for Chikungunya, dengue and both Chikungunya and dengue together respectively. No mortality was reported.

Conclusions: The occurrence of this outbreak stresses the need for carrying out continuous surveillance for vector borne diseases so that appropriate remedial measures are initiated.

Key words: *Out-break, Joint pains, Viral fever*

Dumpala S, Kondagunta N, Malhotra VM, Venna GP, Jothula KY. An outbreak investigation of suspected Chikungunya fever in Nalgonda District of Telangana state. J Clin Sci Res 2014;3:219-23. DOI: <http://dx.doi.org/10.15380/2277-5706.JCSR.14.043>.

INTRODUCTION

Chikungunya is a viral disease transmitted by *Aedes* mosquitoes¹. As with all arboviruses, chikungunya virus outbreaks begin during the rainy season when vector density peaks. Available data suggest that Chikungunya can present both in the form of endemic and epidemic.² It occurs in Sub-Saharan Africa, South-east Asia and other tropical areas of the world including Indian subcontinent. In 1952-53, the first epidemic was reported from Tanzania.³ It was also documented in Burma,

Thailand, Cambodia, Vietnam, India, Sri Lanka, and Philippines.^{4,5} Epidemics were reported from Philippines in 1954, 1956, and 1968,⁶ and also from South Sumatra, Java, Timor, Sulawesi, and the Moluccas Islands in 1982 and 1985.^{4,7} From February, 2006 to Oct 10, 2006, the World Health Organization (WHO) Regional Office for South-East Asia and the National Vector Borne Disease Control Programme of Government of India reported that 151 districts located in ten states of India had been hit by chikungunya fever. Nearly 136 million suspected cases were reported from the

Received: 05 August, 2014.

Corresponding author: Dr Suguna Dumpala, Assistant Professor, Department of Community Medicine, Kamineni Institute of Medical sciences, Narketpally, Nalgonda, Telangana State, India.

e-mail: reachsuguna.dumpala@gmail.com



Online access

http://svimstpt.ap.nic.in/jcsr/oct-dec14_files/10a414.pdf

DOI: <http://dx.doi.org/10.15380/2277-5706.JCSR.14.043>

southern states of this country, where 539 million people live. Andhra Pradesh was the first state to report the suspected cases in December, 2005 and was also one of the worst affected (> 80,000 suspected cases)⁸ in India. The disease was characterized by abrupt, massive epidemics with high attack rates (37%) in India.⁹ The same vectors can sometimes transmit several arboviruses at a time and cause confusing mixed epidemics occasionally which have been described as dengue plus chikungunya virus.¹⁰ In view of above, the investigation of this outbreak of fever cases was conducted to identify the putative agent, source, mode of transmission and recommend control measures.

MATERIAL AND METHODS

Study setting

Nalgonda district in the state of Telangana state is spread over an area of 14,240 sq. km area and has a population of 3,483,000, of which 2,986,000 are rural and 4,98,000 urban as per the 2011 census. Apart from agriculture the district economy is also boosted through its handloom and handicraft industries. Proddutur village, where this outbreak occurred, comes under Varkatpally Primary Health centre (PHC), in Valigonda Mandal which is located on the bank of Musi River, about eight kilometres from the district town. The village has a total population of 1,360 residing in 320 houses. Main occupation of the villagers is farming, cattle rearing and poultry. Most of the houses are along with a pucca, few thatched huts. There is no continuous supply of piped water to the villagers. As a result, water is stored mainly in big cement and plastic tanks at house hold level. The waste water is disposed off by open drains. The village is surrounded by paddy fields.

Data collection

A team consisting of epidemiologist, microbiologist, general physicians, junior

doctors, and medical social-workers visited Proddutur village during 11th to 15th February 2014 to investigate the outbreak at the request of the District Medical and Health Officer, Nalgonda district. A rapid fever survey was conducted and necessary epidemiological data were collected by using pre-tested, structured epidemiological case sheets by interviewing the patients at temporary treatment centres and at households. Operational definition of a case was taken as any person from Proddutur village who is suffering from fever and joint pains for the last one month. In addition to rapid fever survey, case finding was done by reviewing the records of PHC and rapid environmental survey was done. Blood smears were collected by laboratory technician from all patients with fever to rule out malarial fever. Teams were supervised by a faculty to ensure reliability and accuracy of data collection. The epidemic was investigated in the 4th week and 108 out of total 259 patients could be interviewed by the teams. Entomological survey in randomly selected houses was done to identify breeding sites of aedes mosquitoes vector control measures were implemented which included indoor spraying of pyrethrum, use of abate as larvicide and space spray with malathion. Serum samples from 17 patients who attended the temporary treatment centres were sent to Institute of Preventive Medicine (IPM), Hyderabad for relevant laboratory investigations.

Descriptive statistics are reported as percentages.

RESULTS

The outbreak was observed to have occurred during the period of 28th January to 18th February, 2014. The attack rate of chikungunya as per case definition was observed to be 19%. The distribution of cases by age and sex (Table 1) showed that maximum cases (24.1%) occurred in the age group of 21-30 years and in females (51.9%). Fever (100%); chills

Table 1: Distribution of cases by age and gender

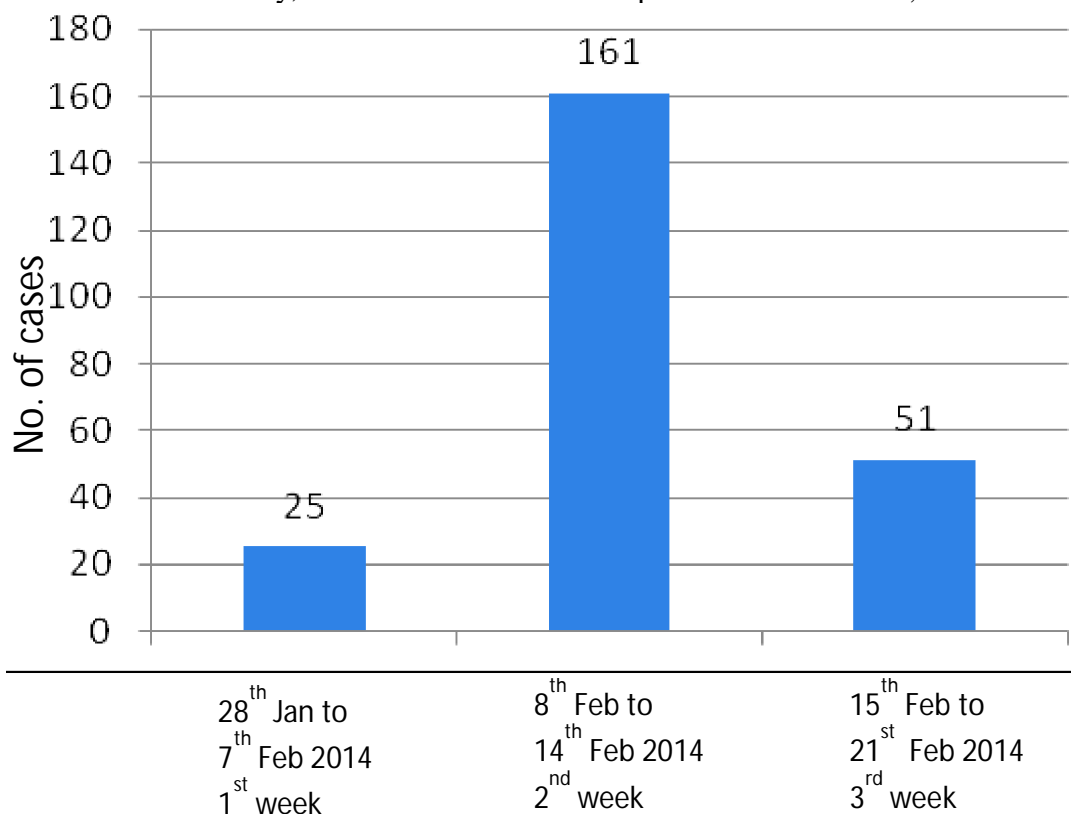
Variable	No.	%
Age (years)		
< 1	2	1.9
1-10	5	4.6
11-20	14	13
21-30	26	24.1
31-40	16	14.8
41-50	19	17.6
51-60	16	14.8
61-70	7	6.5
> 70	3	2.8
Total	108	
Gender		
Male	52	48.2
Female	56	51.9
Total	108	

(89.8%); joint pains (92.6%), headache (67.6%), and backache (54.5%) were the salient presenting symptoms (Table 2). The distribution of cases by the month of occurrence (Figure 1) revealed that the first case was reported on 28th January, 2014 and the

Table 2: Symptoms at presentation

Symptoms	No.	%
Fever	108	100
Joint pains	100	92.6
Chills	97	89.8
Headache	73	67.6
Backache	54	50.0
Vomiting	18	16.7
Eye symptoms	13	12.0
Diarrhoea	06	5.6
Skin rash	06	5.6

maximum number of cases occurred in the second week. The cases escalated from 10th to 12th February 2014 and then levelled off. Spot map showed the clustering of cases in the middle of the village, where it is densely populated as compared to the periphery of the village which was less affected (Figure 2). Entomological survey revealed that none of the 21 water containers tested were positive for *Aedes aegypti* mosquitoes. However, three samples from water tanks, one from rain water

**Figure 1:** Distribution of cases over time

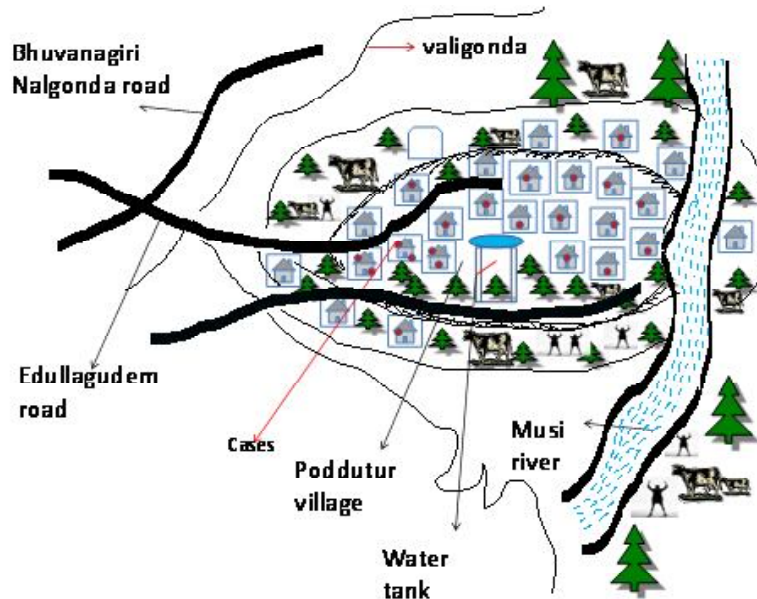


Figure 2: Distribution of cases by place

collection, and two from garden pond revealed the presence of the vector *Aedes aegypti*. Serological investigation revealed the presence of Chikungunya in five cases, dengue in two cases and co-infection in two patients.

DISCUSSION

In this outbreak of Chikungunya, maximum cases occurred in the month of February which is atypical as the previous outbreak in India occurred during the months of August to December.¹¹ The clinical presentation of fever cases was similar to findings reported in other studies.^{11,12} All ages and both genders were affected and similar results were described in an earlier study from Tirupati.¹³ Women were more frequently affected; similar observations were reported in another study from Delhi.¹¹ The outbreak involved 19% of the village population; no mortality was observed during the outbreak. Similar observations were reported earlier.¹¹ The epidemic curve showed that the outbreak started slowly from 28th January with a peak in the 2nd week and slowly tailed off which is typical of vector-borne diseases. The spot map showed clustering of cases in the centre of the village which is densely populated

and also has an over-head water tank with a capacity of 60,000 litres of water. Peri-domestic and domestic areas showed a large number of artificial containers, for example water storage containers, troughs for animals, earthen pots, tyres, coconut shells, plastic bottles etc. Stagnation of water in the river, paddy fields, open drains and domestic/peri-domestic containers provided innumerable sites for breeding of mosquitoes.

One of the limitations of the study was that all the cases could not be confirmed by serology. Serological diagnosis of Chikungunya fever was evident in 5 of the 17 patients tested and 2 patients had evidence of co-infection with dengue and Chikungunya fever.

This outbreak in the pre-monsoon season had an unusual occurrence in January-February months of the year which highlights the importance of monitoring the vector-borne diseases by an arboviral surveillance system round-the-clock throughout the year. Hence, we suggest that this should be integrated with the Integrated Disease Surveillance programme¹⁴ to prevent further epidemics.

ACKNOWLEDGEMENTS

Authors acknowledge the Departments of General Medicine, Microbiology of Kamineni Institute of Medical Sciences (KIMS), Narketpally, District Medical and Health Officer, Nalgonda District, Medical Officer of the Primary Health Centre, Varkatpally, for their help in carrying out this study.

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