

## INVESTIGATION OF MALARIA OUTBREAK IN GADHIGANUR PHC, BELLARY, KARNATAKA 2011

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### Article Info

Received 23/09/2014

Revised 16/10/2014

Accepted 19/10/2014

**Key words:-** Malaria,  
Awareness, north-  
eastern states.

### ABSTRACT

Malaria still remains as the major public health problems in India. Despite numerous control measures, malaria continues to be uninterrupted with high morbidity and mortality in the area of its occurrence. The most affected states are north-eastern states, Gujarat, Rajasthan, Orissa, Karnataka, and Andhra Pradesh. On 10<sup>th</sup> October 2010, Gadhiganur PHC reported a cluster of malaria cases. The investigation was done in this cluster to identify the etiological agent, source of transmission and propose control measures. We identified 792 cases. Cases started from 10<sup>th</sup> October and subsequently increased and peaked on 20<sup>th</sup> October 2010 and declined by 30<sup>th</sup> of October. The attack rate was highest among the productive age group that is from 11 to 30 years (10.04/100) and males were more affected (11.51/100). On entomological surveillance it is noted that large stagnate water bodies are the potential breeding sources for Anopheles & Culex mosquitoes. To control this outbreak we recommended fogging activity, antilarval and antiadult measures. Awareness regarding vector borne disease was also undertaken in the village.

### INTRODUCTION

Malaria still remains as the major public health problems in India. Despite numerous control measures, malaria continues to be uninterrupted with high morbidity and mortality in the area of its occurrence. At present about 109 countries in the world are considered endemic for malaria. Recent estimates indicate that all over the world there are between 300-500 million cases of malaria per year and over 1.5 to 2.7 million deaths due to malaria. Malaria is a major public health problem in India, particularly due to pl. falciparum which is prone to complications. In India about 27 % lives in malaria high

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transmission ( $\geq 1$  case/1000 population) areas [1]. The most affected states are north-eastern states, Gujarat, Rajasthan, Orissa, Karnataka, and Andhra Pradesh [2].

### MATERIALS AND METHODS

On the 10<sup>th</sup> October we got a phone call from District Health Office that there is a malaria outbreak in Gadhiganur Primary health centre. It is a village 40 kms from Bellary. In this PHC area many villages comes among them Bhuvanahalli, Bailuvudhugeri, Kakabal, Dharmasagara and Gadhiganur proper had many fever cases. A team consists of Professors, Assistant professors and postgraduates and statistician went to Gadhiganur.

First we went to health facility and did line listing of all cases and prepared spot map. The first case was 52 year old male had malaria on October 10<sup>th</sup> morning 8 am



was an index case, may be a primary case. Then we entered the field area; a case of malaria was defined as the occurrence of fever with or without chills and rigors and malaria case was confirmed by blood examination. Then we did house to house survey in all five villages and collected information regarding date of onset, age, sex and place of residence, occupation, education, marital status and also information on breeding places, drainage system with help of predesigned, semi-structured questionnaire from 10<sup>th</sup> October to 30<sup>th</sup> October. We calculated attack rates by age, sex and village wise.

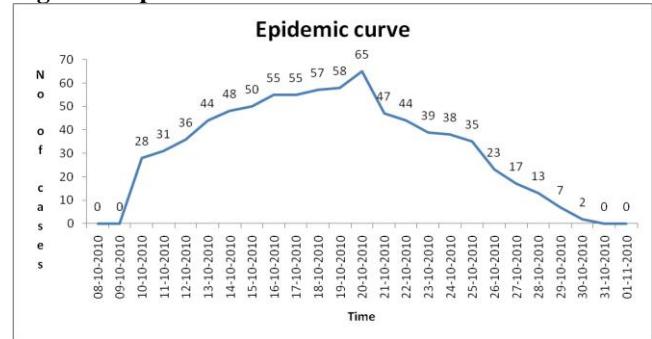
**RESULTS**

We identified 792 cases among them 114 from Bailuvdhugeri, 267 from Bhuvanahalli, 108 from Kakabal, 48 from Dharmsagara and 255 from Gadhiganur (Attack rate of Bailuvdhugeri: 6.86/100, Bhuvanahalli: 22.56/100, Kakabal 9.90/100, Dharmsagara 6.51/100, Gadhiganur 9.35/100).

Cases started from 10<sup>th</sup> October and subsequently increased and peaked on 20<sup>th</sup> October 2010 and declined

by 30<sup>th</sup> of October. The attack rate was highest among the productive age group that is from 11 to 30 years (10.04/100) and males were more affected (11.51/100). Cases were more common in upper lower class (15.7%), married people (11.6%) and illiterate (13.1%). Among 792 cases 318 (40.3%) had vomiting, 359 (45.4%) had generalised body ache, 622 (78.7%) had Chills and rigors and 542 (68.6%) had headache, 149 (18.9%) had pain abdomen.

**Figure 1. Epidemic curve**



**Table 1. Showing demographic profile of cases**

Variables		
Age	Frequency(n=792)	Percentage
0-1	2	0.3
2-20	264	33.3
21-40	276	34.8
41-60	202	25.5
Above 60	48	6.1
<b>Sex</b>		
Male	423	53.4
Female	369	46.6
<b>Occupation</b>		
Profession	3	0.4
Semi Profession	18	2.3
Skilled	8	3.4
Semiskilled	12	1.5
Unskilled	390	49.2
Unemployed	338	42.7
<b>Education</b>		
Not Applicable	62	0.3
Illiterates	255	32.2
Primary	303	44.1
High school	127	16
PUC	24	3.5
Graduate	21	3.9
<b>Marital status</b>		
Married	497	62.8
Unmarried	295	37.2
<b>Socio economic status</b>		
Upper class	30	3.8
Upper middle class	157	19.8
Lower middle class	331	41.8
Upper lower class	175	22.1
Lower class	99	12.5



**Table 2. Showing clinical profile of cases**

Symptoms	Frequency(n=792)	Percentage
Fever with chills	622	78.7
Vomiting	318	40.3
Body ache	359	45.4
Head ache	542	68.6
Pain abdomen	149	18.9

**Table 3. Showing date of onset of cases**

Date of onset	Frequency (n=792)	Percentage
10-10-2010	28	3.5
11-10-2010	31	3.9
12-10-2010	36	4.5
13-10-2010	44	5.6
14-10-2010	48	6.1
15-10-2010	50	6.3
16-10-2010	55	6.9
17-10-2010	55	6.9
18-10-2010	57	7.2
19-10-2010	58	7.3
20-10-2010	65	8.2
21-10-2010	47	5.9
22-10-2010	44	5.6
23-10-2010	39	4.9
24-10-2010	38	4.8
25-10-2010	35	4.4
26-10-2010	23	2.9
27-10-2010	17	2.1
28-10-2010	13	1.6
29-10-2010	7	0.9
30-10-2010	2	0.3

**Table 4. showing attack rate**

Locality	Population at risk	Cases	Attack rate (%)
Bailuvadigeri	1660	114	6.8
Bhuvanalli	1183	267	22.5
Dharmasagar	737	48	6.5
Gadiganur	2727	255	9.3
Kakbal	1090	108	9.9
<b>Age</b>			
0-1	78	2	2.56
2-20	2776	264	9.51
21-40	2712	276	10.18
41-60	1452	202	13.91
Above 60	379	48	12.66
<b>Sex</b>			
Male	3675	423	11.51
Female	3722	369	9.91
<b>Occupation</b>			
Profession	42	3	7.14
Semi Profession	152	18	11.84
Skilled	322	8	2.48
Semiskilled	105	12	11.43
Unskilled	3470	390	11.24
Unemployed	3306	338	10.22



<b>Education</b>			
Not Applicable	1034	62	6.00
Illiterates	1701	255	14.99
Primary	2925	303	10.36
High school	1160	127	10.95
PUC	326	24	7.36
Graduate	251	21	8.37
<b>Marital status</b>			
Married	4255	497	11.68
Unmarried	3142	295	9.39
<b>Socio economic status</b>			
Upper class	475	30	6.32
Upper middle class	1873	157	8.38
Lower middle class	3156	331	10.49
Upper lower class	1115	175	15.70
Lower class	778	99	12.72

On entomological surveillance it is noted that large stagnate water bodies are the potential breeding sources for Anopheles & Culex mosquitoes.

#### **CONCLUSION AND RECOMMENDATION**

The malaria outbreak started on 10<sup>th</sup> October 2010, peaked on 20<sup>th</sup> and lasted till 30<sup>th</sup> October 2010. The attack rate was highest among productive age group and males. Cases were more common in upper lower class and illiterates. This outbreak was possibly caused by large stagnate water bodies which are the potential breeding sources for Anopheles & Culex mosquitoes. To control

this outbreak we recommended fogging activity, anti-larval and anti-adult measures. We asked village people to have one dry day so that all water bodies kept dry for one day and also source reduction activity. Awareness regarding vector borne disease was also undertaken in the village

#### **ACKNOWLEDGEMENTS**

Authors acknowledge the services of health personnel of Gadhiganur Primary Health Centre and also Bellary district health authority for their support.

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