

## EMERGENCE OF DENGUE IN HAKKI-PIKKI TRIBES OF ANGADIHALLI, HASSAN DISTRICT, KARNATAKA

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**Abstract:** The study was conducted to investigate the epidemiology of dengue disease in Hakki-Pikki tribes of Angadihalli, Hassan district, Karnataka, India. Dengue fever is a arboviral infection which is endemic in tropical country like India. The Hakki-Pikkitribes who suffered from dengue had a frequent visit to forest areas for fetching forest products and it is a part of their traditional practices. They have a semi-nomadic lifestyle with unhealthy food habits and unhygienic practices. The nutrition level of community was poor along with early marriages resulting in more no of offspring's in early parental life. They are lack toilets and unhygienic sanitary conditions prevalent in the community. The livestock rearing practices was nil. The dengue suspects are reported from the various hospitals in Hassan. The diagnosis is based on lateral flow assay depended rapid test kits specific antibodies to detect the IgM and IgG antibodies, where the positive brown suspects a case to dengue. The platelet counts were low, correlation was observed between the rapid test kit and thrombocytopenia. The clinical symptoms such as fever, chills, body pains, vomit, joint pain, headache, skin rashes and bleeding disorders which are quite common in all the suspected cases. Based on this dengue suspected tribes and normal population were graded. The knowledge of vector borne diseases was poor and ways to control the infection among them was less evident. The control measures taken by district administrative officialshelped in reducing the disease incidence and create awareness among the tribes.

**Keywords:** Dengue fever, Livestock rearing, Hakki-Pikki tribes, Nomadic life, Unhygienic conditions.

### 1. INTRODUCTION

Dengue (DEN) is a rapidly spreading arboviral disease transmitted by *Aedes* mosquito. According to World Health Organization (WHO, 2013) more than 2.5 billion people are at risk of dengue infection. Reporting 50 million cases and 24,000 deaths with more than 100 endemic countries. The dengue fever is more prevalent and endemic in many African, Mediterranean region and South East Asian countries. India is being major endemic country in the Southeast Asia region reporting with dengue fever (DF)/dengue haemorrhagic fever (DHF) outbreaks regularly (Dash et al., 2013). The first report of dengue fever in India was from Vellore during 1956. Dengue haemorrhagic fever occurred in Calcutta in 1963. In India,

annual incidence is estimated to be 7.5 to 32.5 million (Gupta et al., 2006; Barde et al., 2015). DHF is epidemic in India lead to development of national co-ordinated surveillance systems under National Vector Borne Disease Control Program (NVBDCP), which issues guidelines for prevention and control of dengue along with vector management tools.

The Hassan district occupies a western position in the state of Karnataka. Geographical location is belts of western ghat forest ranges with annual rainfall of 400mm and humid climatic condition. The Hakki-pikki tribes are semi nomadic and they are Kshatriya or warrior tribal community who had to migrate southern India after their defeat with Mughal kings (Nanjundayya and Iyer, 1930). The Hakki-pikki tribes have good Indigenous Traditional Knowledge (ITK) for preparation of medicine and massage creams by using various medicinal plants. The forest is in a radius of 10-15 kilometres from the tribal location, which favours their frequent visits to forest (Guruprasad et al., 2015).

They have unique experience to hunt and capture birds and animals alive without damaging to creature and causing any wounds. They follow seminomadic lifestyle where male in family go outstation for labour work, business and extraction of forest products. Female maintain the family in his absence, with marketing of polishing beads, organizing decorative flowers and vases (Basu, 1993). The Hakki-pikki lifestyle is peculiar compared to general public, related to family and marriages. The consumption of alcohol is common among men, women, young and old aged which makes them as habitual drinkers. On festive and rituals, they prepare meethakhana or sweet dishes and celebrate in their own way (Nag, 1980).

They have diverse food habits, socio-cultural practices and hygienic practices followed since age. There may be a relationship between disease and other factors promoting spread of disease. Hence, the present study was taken up to study the epidemiology of dengue disease spread pattern among the tribal population and the factors responsible for disease spread.

## **2. RESEARCH METHODOLOGY**

### **2.1 STUDY AREA**

Hassan district, Karnataka begins at the bottom of steep Western Ghats and continues into Deccan plateau. It is located between 12° 13' and 13° 33' North latitudes and 75° 33' and 76° 38' East longitude. The extreme variations in climatic condition specially in rainfall results in a wide range of vegetations. Angadihalli is village on the Hassan-Belur road and it is a rehabilitated place for HakkiPikki tribes.

## **2.2 HAKKI-PIKKI TRIBAL PEOPLE**

The *HakkiPikki* is a diminishing tribe in Karnataka, members were earlier living in forests, hunting animals and birds for their livelihood. These communities were originally residing in the Seegegudda State forest, they moved out of the forests after laws curtailing their right over forest produces were implemented. The population of Angadihalli is 1500, apart from *HakkiPikki*, there are members of Sillekyatha, Budubuduke and most of them are nomads and wander from one place to other. Basically, the HakkiPikkis are non-vegetarian. The food habit is almost not completely isolated and independent of nomadic way of life. One of the reasons of HakkiPikki nomadism is said to be their food habit (Mann, 1981; Bisai et al., 2014)

## **2.3 DATA COLLECTION**

The village had a population of around 300 houses of Hakki-Pikki tribes with more than 2000 people and other tribes such as Budbudake and Sillekyatha live in adjacent locality of same village. The village had general population of 3000 people belonging various caste and religions. Respondents were selected by simple random sampling method. Total of 250 respondents were selected, which includes 100 dengue disease suspected family (DHP), 100 from non-dengue affected family of Hakki-Pikki tribe (NDHP) and 50 respondents of general population (GP) for the epidemiological study. The data was collected with respect to health status, housing pattern, material possession, alcoholic beverages consumption, drainage system, soil type, toilet facilities and frequency of non-veg consumption. Reports of Dengue were photographed. Data collected from affected individual on clinical symptoms were tabulated and statistically analysed using simple statistical tools like mean average and percentage. The post awareness improvement in living status is assessed based on cleanliness index and visual scoring card of the interviewer.

## **3. RESULTS AND DISCUSSION**

### **3.1 SELECTION OF DENGUE SUSPECTS CASES FROM TRIBAL STUDY POPULATION**

The dengue suspects are recorded from the various hospitals. The diagnosis is based on lateral flow assay depended rapid test kits specific antibodies to detect the IgM and IgG antibodies, where the brown colour positive indicates suspects to dengue. The platelet counts are accounted, where correlation was observed between the rapid test kit and thrombocytopenia. The clinical symptoms such as fever, chills, body pains, vomit, joint pain, headache, skin rashes and bleeding disorders which are quite common in all suspected cases

(WHO, 1997). Based on this dengue suspect and normal population were graded and further epidemiological data was collected.

The first dengue suspected was in late February, an eighteen-year-old male Shiva, who exhibited the symptoms in late night and he was shifted to tertiary hospital in Hassan for urgent medical attention. Blood parameters were recorded and suspected for dengue and later confirmed with Rapid test kits. He recovered after 5 days of treatment and was discharged from hospital and he came back to his community. Later the disease was identified in many individual with dengue suspects in same locality. We suspect this individual as point source for sporadic disease in the village with other favouring factors for occurrence. On his interview, he revealed he had been to forest to fetch some medicinal plants and forest products for his business purpose. Within 36 hours, disease was clinically manifested and he was recovered within 15 days but still he is suffered with sequel of disease such as tiredness, back pain and joint pains.

### **3.2 EPIDEMIOLOGICAL STUDY OF DENGUE SUSPECT AND NORMAL POPULATION**

The epidemiological survey with dengue suspected and healthy population of tribal and non-tribal respondents were documented in Table. 1. The dengue is vector borne disease. The reason for occurrence of disease is mosquito population and humid environment. Hence, water stagnation factors are precipitating factors for disease occurrence. The bathing practice is peculiar in tribal population, where majority of them have a poor bathing practice or unhygienic bathing practices. The most of dengue suspects have weekly once bathing (Guruprasad et al., 2015). The most of them take bath outside the house, which may lead the favouring conditions for mosquito proliferation and precipitate the disease occurrence. The tribal suspects were addicted to liquor and they have very low immune status. The housing pattern of tribes was very poor compared to non tribes. The floor type of most of tribes was asphalt in that more of dengue suspected family lives in sand flooring. The roof is of asbestos sheet in tribal population.

The space between the tribal houses is very critical and pathetic compared to non-tribes. Most of the houses were attached and was no space in most dengue suspected families. The ventilation was poor in dengue suspects where they live in minimum ventilation and a single window. The conditions were better in control group and non-tribals. The toilet facility is poor in tribes where government schemes have built toilets, but usage percentage and awareness is very poor. Majority of tribes suspected for dengue defecates in open area. The

condition is good in non-tribal group, where the literacy is good and similarly the awareness on usage of toilets and government scheme is well. The sanitation and connection of gutter pipes with central lane for proper disposal is poor in tribal locality compared to non-tribes. Majority of them leave the gutter pipe as open space between houses. Which directly affect the living quality, status of housing pattern between houses and locality (Barde et al., 2015).

The material possession is more or less similar between tribal and non-tribal population. The consumption of livestock products is similar but milk consumption is more in non-tribal population. Hakki-pikki tribes consume meat on a relatively regular basis, but it was less than 2 kg per month irrespective of whether they rear livestock or not. They do not have a habit of consuming milk and milk products. The nearest health care, police station and veterinary centre is in 3kms radius. The village connected with good transport facility as the highway runs through the village. The constant misunderstanding and quarrels between tribes and non-tribes was quite common in the village.

The vector control is critical variable as corresponding to present study due to on occurrence of dengue suspects and living quality of tribal and nontribal population. The measure taken to control the mosquito population is very poor in dengue suspected families and most don't take any measure to control. The usage of mosquito net, coils and repellents is good in non-tribes compared to tribes. The mosquito breeding site was noticed in vicinity of tribal locality and drainage collection area, which located at end of village. The highway passes between the village which also expose the vicinity to import disease from outsiders and vehicles as mode of transmission. The mosquito breeding site such as metal tanks, plastic drum, overhead tank, discarded utensils, coconut shells, stagnation of water were noticed near the locality (Gubler et al., 1988). The awareness on technique to eliminate the vectors i.e., mosquito was poorly known to tribal compared to nontribal. The tribes use some ITK leaves and burn them in order to reduce the mosquito population, but its identity or name is unknown.

### **3.3 KNOWLEDGE OF DENGUE DISEASE AMONG THE POPULATION**

The tribes had no knowledge on dengue disease and first notified to them after the few cases of dengue through local health care awareness program. The mosquito borne disease is new for the tribes and non-tribes. The district administrative officials took precautionary steps to check the spread of disease and to create awareness among tribes and non-tribes. No mortality was noticed in a period of occurrence.

## Conclusion

Conducive man-made environment favouring mosquito genic conditions and seeding of virus could be the probable reasons for this outbreak. Urgent attention is needed to control this new threat to tribal population, which is already overburdened with other health and nutritional diseases.

## Recommendation

- Ideal approach to prevent dengue is to eliminate areas where the dengue mosquito lays its eggs.
- Adequate knowledge of proper disposal of garbage
- Cleaning the surroundings of the house which can bring about stagnant water such as water jars and flower pots.
- Testimonials and campaigns can be used to create awareness
- Use of mosquito repellent.
- Reduce mosquito habitat

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**Table1: Representation of factors responsible for diseasespread and epidemiology**

Variables	Affected group (n=100)	Control group (n=100)	Non-tribal (n=50)
	DHP	NDHP	GP
<b>Bathing practice</b>			
<b>a)</b> Frequency of bathing			
<b>i)</b> Weekly once	34 (34%)	12 (12%)	1 (2%)
<b>ii)</b> Weekly twice	29 (29%)	38 (38%)	12 (24%)
<b>iii)</b> Daily	27 (27%)	50 (50%)	37 (74%)
<b>b)</b> Bathing place			
<b>i)</b> Outside housie	74 (74%)	56 (56%)	2 (4%)
<b>ii)</b> Inside house	26 (16%)	44 (44%)	48 (96%)
<b>Liquor consumption</b>			
<b>a)</b> Weekly once	2 (2%)	10 (10%)	24 (48%)
<b>b)</b> Weekly twice	17 (17%)	22 (22%)	12 (24%)
<b>c)</b> Daily	81 (81%)	68 (68%)	14 (28%)
<b>Housing</b>			
<b>a)</b> Type of floor			
<b>i)</b> Asphalt	57 (57%)	76 (76%)	8 (16%)
<b>ii)</b> Sand	41 (41%)	18 (18%)	5 (10%)
<b>iii)</b> Granite	2 (2%)	6 (6%)	37 (74%)
<b>b)</b> Type of roof			

i)	RCC	21 (21%)	22(22%)	28 (56%)
ii)	Asbestos sheet	74 (74%)	67 (67%)	20 (20%)
iii)	Clay tiles	5 (5%)	11 (11%)	2 (4%)
<b>c)</b>	<b>Space between house</b>			
i)	Attached	79 (79%)	64 (64%)	2 (4%)
ii)	Less than 1m	16 (16%)	27 (27%)	22 (44%)
iii)	1-5 meters	5 (5%)	9 (9%)	26 (52%)
<b>d)</b>	<b>Ventilation (Windows)</b>			
i)	1	64 (64%)	59 (59%)	1 (2%)
ii)	1-3	28 (28%)	24 (24%)	32 (64%)
iii)	More than 3	8 (8%)	17 (17%)	17 (34%)
<b>Toilet facility</b>				
<b>a)</b>	<b>Inside the house</b>	26 (26%)	48 (48%)	48 (96%)
<b>b)</b>	<b>Outside the house</b>	74 (74%)	52 (52%)	2 (4%)
<b>Vector control</b>				
<b>a.</b>	<b>Use of mosquito net</b>	12 (12%)	28 (28%)	32 (64%)
<b>b.</b>	<b>Use of mosquito coil</b>	24 (29%)	67 (67%)	49 (49%)
<b>c.</b>	<b>Use of mosquito repellents</b>	3 (3%)	12 (12%)	21 (42%)
<b>d.</b>	<b>No control measure</b>	76 (76%)	18 (18%)	2 (4%)
<b>Sanitation facilities</b>				
<b>a)</b>	<b>Connected to Sewage lines</b>	21 (21%)	35 (35%)	38 (76%)
<b>b)</b>	<b>Not connected to Sewage lines</b>	79 (79%)	65 (65%)	12 (24%)