



A STUDY OF FACTORS ASSOCIATED WITH DENGUE FEVER IN A DISTRICT IN CENTRAL INDIA.

General Medicine

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ABSTRACT

Background: Dengue Fever (DF) is one of the most common mosquito borne viral disease prevalent in central India especially during the monsoon and often causes high mortality and morbidity. Hence we conducted this study to study the factors associated with dengue fever so that we can help control it.

Methods: This was a case control study carried out in the department of general medicine in a tertiary hospital in central india from 1st june 2017 to 30th September 2017. We conducted a 1:2 un-matched case control study and hence a total of 100 cases and 200 controls were studied in total.

Results: A total of 300 persons was taken with 100 cases and 200 controls. Majority were males i.e. 70/100 in cases and 120/200 in controls. The mean age was 25.2 ± 8.5 standard deviation (SD) for cases and 29.3 ± 11.2 SD for controls. From the samples tested for dengue, 80 were confirmed positive. Among the factors studied, contact with dengue positive patient, stagnant water around the house and non usage of mosquito nets were associated with high risk.

KEYWORDS

dengue fever

INTRODUCTION-

Dengue fever is a mosquito-borne tropical disease caused by the dengue virus.^[1] Symptoms typically begin three to fourteen days after infection.^[2] This may include a high fever, headache, vomiting, muscle and joint pains, and a characteristic skin rash.^{[1][2]} Recovery generally takes two to seven days.^[1] In a small proportion of cases, the disease develops into severe dengue, also known as dengue hemorrhagic fever, resulting in bleeding, low levels of blood platelets and blood plasma leakage, or into dengue shock syndrome, where dangerously low blood pressure occurs.^{[1][2]}

Dengue is spread by several species of female mosquitoes of the *Aedes* type, principally *A. aegypti*.^{[2][1]} The virus has five types,^{[3][4]} infection with one type usually gives lifelong immunity to that type, but only short-term immunity to the others.^[1] Subsequent infection with a different type increases the risk of severe complications.^[1] A number of tests are available to confirm the diagnosis including detecting antibodies to the virus or its RNA.^[2]

A vaccine for dengue fever has been approved and is commercially available in a number of countries.^[5] The vaccine, however, is only recommended in those who have been previously infected. Other methods of prevention include reducing mosquito habitat and limiting exposure to bites.^[1] This may be done by getting rid of or covering standing water and wearing clothing that covers much of the body.^[1]

The characteristic symptoms of dengue are sudden-onset fever, headache (typically located behind the eyes), muscle and joint pains, and a rash. The alternative name for dengue, "breakbone fever", comes from the associated muscle and joint pains.^{[6][7]} Those who develop significantly low blood pressure may have a fatality rate of up to 26%.^[9] Hence, we conducted this study to study the risk factors for dengue so that we can control it.

MATERIAL AND METHODS-

This case control study was conducted on patients admitted in medicine ward in a tertiary hospital in central India with suspected Dengue fever. The inclusion criteria include all confirmed or epidemiologically linked cases of Dengue fever from 1st June 2017 to 30th September, 2017 were included in the study. For the Controls, resident who was a neighbor to a case and who did not develop signs and symptoms of Dengue fever were included. Thus a total of 100 cases were interviewed with a ratio of 1:2 making the controls 200. Controls were neighbors of cases. After each case was interviewed at the hospital, their houses were visited and neighbors were interviewed. Appropriate statistical methods were applied and analysis was done.

RESULTS-

A total of 300 individuals (100 cases and 200 controls) were

approached for interview. Response rate of the study was 100%, No decline of participant in the study individuals. From the total respondents, 190 were males and 110 were females. Out of the 100 cases, 70(70%) were males. The mean age was 25.2 ± 8.5 standard deviation (SD) for cases and 29.3 ± 11.2 SD for controls, 60(60%) were singles and 40(40%) were married. (Table 1).

The interviewees were also asked knowledge questions regarding DF and out of the total cases, 50% of them heard about DF, while the rest 80% of the controls had a clue about the disease. Only 15% of the cases and 17.5% of the controls stated virus as the cause for DF. (Table 2).

25% of the cases were exposed to stagnant water around their house of which 80% of them living at a distance of < 100 m from the stagnant water. In terms of close contact, 60% of the cases had close contact with a person of the same complaint, while only 30% of the controls had similar exposure. Also strong association was found between usages of mosquito nets. (Table 3).

DISCUSSION- Dengue is one of the most common cause of viral fever in the month of monsoon especially in central india and causes much panic among the general public requiring many hospital admissions resulting in mortality and high morbidity. This study showed that the risk factors of Dengue fever were the availability of stagnant water around the house, the non-use of mosquito nets and having close contact with Dengue Fever patient. Those who have stagnant water around their houses were 4 times more at risk to have the disease. In consistence to this, results of a case control study carried out in Vietnam identified that people living near stagnant water like ponds, lakes or open sewers had higher rates of morbidity [10]. The DF epidemic in Brazil was also associated with proximity to uncontrolled waterways and stagnant water in tanks, gutters and cans [11]. This may be due to the fact that, *Aedes aegypti* breeds on artificial and natural water containers almost in and around households, construction sites, factories, etc. [12].

This study has also found a significant association between Dengue fever and close contact with Dengue patient. Having close contact with Dengue fever patient has a 6.2 times risk in acquiring the disease. This may be because of the likely availability of *Aedes aegypti* breeding site around the sick person's living environment which will also be a risk factor for a person spending more time with the patient.

Additionally, there is an association found between the uses of mosquito nets and Dengue fever showing that people who do not use mosquito nets were 4 times more likely to get infected than those who use. Another study done in Angola has also found that Behavior

associated with protection from DENV infection included having recently used mosquito avoidance strategies (such as applying mosquito repellent or sleeping under a bed net) were protective from the disease [13].

The knowledge of the community regarding DF was also assessed and it was found that about 70% of the participants have heard about DF previously out of which 24% were cases. However, in a study conducted in Karachi, 96.5% of high socio-economic population and 88% of low socio-economic population have heard about the disease [14]. This discrepancy may be due to the recurrent occurrence of DF in Pakistan. Regarding the breeding site of the mosquito, only about a quarter of the cases had idea that water is required for the mosquito to breed. Whereas the study in Lahore had showed that almost half of the patients knew stagnant water as a favorable breeding site. We conducted the study only on the hospitalized cases of dengue fever and many more asymptomatic cases could be missing in community. Moreover, controls were not willing to give blood samples and therefore it was not possible to confirm whether they were really free of the disease. Thus a larger study needs to be done to extrapolate the findings to general population.

CONCLUSION-

Our study concluded that close contact with a dengue patient, Presence of stagnant water around the house, not using mosquito nets and repellants while sleeping were found to be associated with dengue fever hence these factors should be taken into consideration as well as IEC activities needs to be more strengthened especially just before monsoons

Table 1: Socio-demographic profile of Dengue fever Cases and Controls

Characteristic	Cases N=100	Controls N=200	Total N=300	P value
Sex				
MALE	70	120	190	
FEMALE	30	80	110	0.44
Age group				
<12yrs	10	25	35	
12-44 years	60	100	160	
>45 years	30	75	105	0.04
Marital status				
Single	60	110	170	
Married	40	90	130	0.66
Education				
Illiterate	15	25	40	
Primary school	20	50	70	
Secondary school	40	80	120	
College/university	25	45	70	0.45
Religion				
Hindu	55	120	175	
Buddhist	25	50	75	
Muslims	20	30	50	0.21

Table 2: Showing knowledge about Dengue Fever among cases and controls

Characteristic	Cases N=100	Controls N=200	Total N=300	P value
Heard about dengue				
Yes	70	160	130	
No	30	40	70	
Cause of dengue				
Know	55	120	175	
Don't know	45	80	125	
Mode of transmission				
Know	55	125	180	
Don't know	45	75	120	
Time mosquito bites				
Know	60	110	170	
Don't know	40	90	130	
Knew symptoms				
Yes	70	110	180	
No	30	90	120	

Table 3: Showing Risk factors among Dengue Fever cases and controls

Characteristics	Cases N=100	Controls N=200	Total N=300	P value
Infected Previously				
Yes	10	15	25	
No	90	185	275	0.32
Utilization of LLINs				
Yes	15	110	125	
No	85	90	175	0.02
Types of clothes				
Short sleeves	70	135	205	
Long sleeves	30	65	95	0.24
Use of mosquito repellent				
Yes	5	30	35	
No	95	170	265	0.001
Stagnant water near				
Yes	25	30	55	
No	75	170	245	0.001

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