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A PROSPECTIVE REPORT ON DENGUE OUTBREAK IN NORTH 24 PARGANAS, WEST BENGAL

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ABSTRACT

Dengue is the most rapidly spreading mosquito-borne viral disease of mankind, with a 30 fold increase in global incidence over the last five decades. According to World Health Organization (WHO), about 50–100 million new dengue infections are estimated to occur annually in more than 100 endemic countries, with a steady increase in the number of countries reporting the disease. A survey was conducted in Bashirhat subdivision. Data were collected through nearest nursing home and laboratory. Consent and ethical committee permission were taken from the competent authorities. A total of 335 samples comprising both male and female are taken for the study. Among the 335 subjects 157 are affected by dengue, and the rest is not affected by the killer disease dengue. The normal platelet count ranges between 1.5-4 lakh/ccm with the average of 2.75 lakh/ccm. The study reveals that all the patients were having the platelet count below average only a few patients were having the acceptable platelet count between 2.51 to 3.0 lakhs/ccm and above. It may be concluded that now-a-days, dengue is a leading problem for the people of the Bashirhat subdivision. Dengue fever is marked with significant decrease in the platelet count thus leading towards various complications. Awareness should be created among the community to reduce the conditions leading to the growth of mosquitos, which is the main culprit of dengue disease.

KEYWORDS: Dengue, platelet count, endemic.

INTRODUCTION

Dengue is the most rapidly spreading mosquito-borne viral disease of mankind, with a 30 fold increase in global incidence over the last five decades. It is a major public health concern throughout the tropical and subtropical regions of the world. Almost half of the world's population lives in countries where dengue is endemic. According to World Health Organization (WHO), about 50–100 million new dengue infections are estimated to occur annually in more than 100 endemic countries, with a steady increase in the number of countries reporting the disease.[1] The number of dengue cases reported annually to WHO has increased from 0.4 to 1.3 million in the decade 1996–2005, reaching 2.2 million in 2010 and 3.2 million in 2015.[2,3] Dengue fever is also called "break-bone" fever because it causes severe joint and muscle pain. Every year, hundreds of thousands of severe cases arise, of which 20,000 lead to death. The loss to the economy is 264 disability-adjusted life years (DALYs) per million populations per year.[3,4]

The first dengue fever or dengue hemorrhagic fever (DF/DHF) outbreak occurred in Kolkata (West Bengal) in 1963.[5,6] Recurring outbreaks of dengue fever (DF)/DHF have been reported from various states. Over 18,700 cases of dengue have been reported in the country this year. The maximum numbers of cases have been reported in Kerala with 9,104 followed by Tamil Nadu with 4,174. According to the figures provided by the ministry, Karnataka has reported 1,945 cases, Gujarat with 616, Andhra Pradesh with 606 and West Bengal with 469 cases. Every year, during the period July–November, an upsurge in the cases of dengue/DHF has been observed. The disease has a seasonal pattern; the cases peak after the monsoons and are not uniformly distributed throughout the year. However, the states in the southern and western parts of the country report perennial transmission.[7,8]

Dengue viruses are members of the genus Flavivirus, within the family *Flaviviridae*. There are 4 dengue virus serotypes (DEN-1, DEN-2, DEN-3 and DEN-4),[9] which are single stranded RNA and are small in size (50 nm). These serotypes may be in circulation either singly, or more than one can be in circulation in any area at the same time. When a mosquito carrying dengue virus bites a person, the virus enters the skin together with the

mosquito's saliva. It binds to and enters white blood cells, and reproduces inside the cells while they move throughout the body. The white blood cells respond by producing a number of signaling proteins, such as interferon, which are responsible for many of the symptoms, such as the fever, the flu-like symptoms and the severe pains. In severe infection, the virus production inside the body is greatly increased, and many more organs (such as the liver and the bone marrow) can be affected, and fluid from the bloodstream leaks through the wall of small blood vessels into body cavities. As a result, less blood circulates in the blood vessels, and the blood pressure becomes so low that it cannot supply sufficient blood to vital organs. Furthermore, dysfunction of the bone marrow leads to reduced numbers of platelets, which are necessary for effective blood clotting; this increases the risk of bleeding, the other major complication of dengue fever.[10]

The majority of dengue virus infections are asymptomatic. For clinical cases the incubation period is usually 4–7 days but can be in the range 3–14 days. The most common clinical symptom are sudden onset of fever accompanied by headache, retro-orbital pain, generalized myalgia and arthralgia, flushing of the face, anorexia, abdominal pain and nausea. Rash is frequently seen on the trunk, arms and thighs. Laboratory detected abnormalities
may include leukopenia and thrombocytopenia.

OBJECTIVES

- To analyze the prevalence of dengue in Bashirhat Subdivision, North 24 Parganas, West Bengal
- To know the symptoms and health conditions of the people suffering from dengue.

MATERIALS AND METHODS

A survey was conducted in Bashirhat subdivision. Data were collected through nearest nursing home and laboratory. Consent and ethical committee permission were taken from the competent authorities. A total of 335 samples comprising both male and female are taken for the study. Blood samples of patients within 3 days of fever onset were collected and sent to laboratory for NS1 detection. Patients with clinical history of dengue were selected for the study. Information regarding age, gender, prevalence, platelet count and packed cell volume (%) were sought. The initial platelet counts at the time of the admission to the hospital till the fourth day were taken and the data were compared to find out the actual severity of the disease. During first five days of illness, dengue can be diagnosed by antigen and nucleic acid detection. Antibodies IgM and IgG can be detected reliably after 3-4 days of post symptom onset.[11-13] RT-PCR (Reverse transcription - Polymerase Chain Reaction), IFA (Indirect Immuno florescence Assay) are expensive and available only in higher centers. ELISA (Enzyme Linked Immunosorbent Assay) and RDT (Rapid Diagnostic Methods) are the most commonly preferred methods for both antigen and antibody detection (IgM and IgG). *Dengue NS1 Ag Microlisa* is a solid phase enzyme linked immunosorbent assay (ELISA) based on the "Direct Sandwich" principle was used. Elisa test was used as the confirmatory test for the dengue.

RESULT AND DISCUSSION

Table 1: Distribution according to age.

Age Groups (in years)	Frequency	Percentage (%)
1 -10	16	10.19
11- 20	17	10.82
21-30	55	35.03
31-40	29	18.47
41-50	21	13.37
51-60	13	8.28
61- 70	6	3.82
Total	**157**	**99.98**

Among 157 patients, dengue is more common among the age group of 21 to 30 years as compared to other age groups. Pal et al. observed that the mean age of patients suffering with dengue was 30 years.[14]

Table II: Distribution according to gender.

Gender	Frequency	Percentage (%)
Male	80	50.96
Female	77	49.04
Total	**157**	**100.00**

Out of 157, 80 patients (50.96%) were male and 49.04% were females. It observed that dengue was distributed more evenly between male and female[14] which is consistent with the present study. Male preponderance was also observed by Gupta *et al.;,*[15] chakravarthi *et al.;*[16] Nisarta et al. reported that females were more commonly affected than males, with male to female ratio of 1:1.35.[17]

Table III: Distribution according to Dengue Antigen NS1.

Dengue Antigen NS1	Frequency	Percentage (%)
Positive	157	46.86
Negative	178	53.13
Total	**335**	**99.99**

The table showed that out of 335 subjects,157 were affected by dengue, and least is not affected by the killer disease dengue.

Most of the studies shown maximum sensitivity of NS1 detection in 2-4 days.[14] During primary infections, NS1 levels peak around 4-5 post symptom onset, but it wanes earlier during secondary infections.[18]

Table IV: Distribution according to Platelet Count on the day of admission.

Platelet Count Range (in lakhs)	Frequency	Percentage (%)
< 1.50	43	27.38
1.50 -2.0	66	42.03
2.01- 2.50	38	24.20
2.51-3.0	9	5.73
>3.01	1	0.63
Total	**157**	**99.97**

The normal platelet count ranges between 1.5-4 lakh with the average of 2.75 lakh/ccm. The above data reveals that all the patients were having the platelet count below average only a few patients were having the acceptable platelet count between 2.51 to 3.0 lakhs and above.

Table V: Distribution according to decrease in Platelet Count on four consecutive days after admission.

Decrease in Platelet Count Range (%)	Frequency (%)			
	4th day	5th day	6th day	7th day
0 to 25 %	85 (69.10)	32 (26.44)	34 (28.09)	53 (53)
25 to 50 %	34 (27.64)	67 (55.37)	58 (47.93)	37 (37)
50 to 75 %	4 (3.25)	21 (17.35)	23 (19.0)	6(6)
75 to above	0	1 (0.82)	6 (4.95)	4(4)
Total	**N=123**	**N=121**	**N=121**	**N=100**

Dengue fever is marked with significant decrease in the platelet count which leads to various complications. This table shows the change in the platelet count consecutively for four days after the admission in the hospital. The total number of patients on 4th day, 5th day, 6th day and 7th day is 123,121,121 and 100.The number is less than the total frequency of 157 because some patient died and some were referred to multispecialty hospitals. The numbers of patient who remained till the last and were cured were 100.

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CONCLUSION

This report shows the actual condition of the patients getting admission in the health centres. The way its frequency is rising among the community, is a matter of great concern and needs prompt action.

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