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Original Research Article

Socio-Environmental Factors Associated with Dengue Fever Prevalence in Central Indian Population: A Cross-Sectional Study

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Abstract:

Background and Objectives: Incidence and Prevalence assessment as epidemiologic measures for evaluating the burden of dengue plays a vital role in making management strategies and monitoring disease control progress. Hence, this is an important evaluating factor for evaluating the actual burden. The present trial was aimed at assessing gender and age-specific dengue incidence in the Sasaram Rohtas, cohort with the help of associated factors and prevalence in dengue infection.

Methods: The present clinical trial was carried out in 600 subjects of 0-70 years of age. Epidemiologic and laboratory findings were collected from the hospital and the collected data were subjected to statistical evaluation and the results were formulated.

Results: There were more females in the present study compared to males. The highest positivity rate in Dengue was seen in the age group of 0 to 9 years. Among 243 adult males, 70 (28.80%) and among 357 adult females, 170 (24.08%) were found to be suffering from dengue infection. Concerning dengue positivity, there were 156 dengue positive cases and 444 dengue negative cases. In age group of 0-2, 2-9, 10-19, 20-29, 30-39, 40-49, 50-59 and 60 years above, there were 14.10% (n=22), 19.87% (n=310, 16.66% (n=26), 14.10% (n=22), 10.25% (n=16), 8.97% (n=14), 10.89% (n=17), and 5.12% (n=8) subjects respectively. This shows maximum cases in 0-19 years of age and decreases incidence with increasing age.

Conclusion: Within its limitations, the present study concludes that dengue incidence decrease with increasing age. Such studies assessing seroprevalence should be conducted on regular basis to assess a clear picture of the dengue burden in Rohtas, Bihar.

Keywords: Aedes Egypti, Break bone Fever, Dengue Infection, Lethargy, NS1 Antigen.

Introduction

Dengue infection affects a large population globally, including India, and poses a great burden on the social, economic, and health sectors of the country. WHO (World Health Organization) reports affects approximately 3.9 billion people residing in countries endemic to dengue and 390 million people in total per year. Approximately 75% of dengue cases are reported in Western Pacific and south-east regions posing a great burden on them. [1] In the last 50 years, there is a nearly 30 times increase in dengue cases in nearly 120 countries. In India, dengue is seen seasonally with increased evidence each year based on regions. This increase can be attributed to hospital-based reporting of the data. [2]

Despite advances in medical science and enormous efforts to control dengue, it is still a threat to the Indian population. Earlier, dengue was seen in only urban areas with the recent spread being reported in all the states. The global dengue research agenda recommends the assessment of dengue burden as a priority to control its spread. Despite associated mortality and increase in dengue infection, limited data in literature focused on assessing dengue burden in the Indian population. In epidemiological studies, prevalence and incidence are the indicators used commonly to assess disease burden. Hence, a comprehensive method is the need of recent times for estimating disease burden on factors like death and cases. [3]

Dengue infections are usually associated with various abiotic and biotic factors including climatic variables like humidity, temperature, rainfall, better surveillance system, ineffective mosquito control, increased human travel, urbanization, and/or population growth. Other such factors are the social behavior of the population, herd immunity, predominant circulating dengue serotypes, effectiveness of vector control systems, capacity of healthcare systems, and health system readiness. [4] few challenges exist in estimating the actual incidence and

prevalence of dengue, one such challenge lies in the fact that the majority of dengue subjects are asymptomatic, and hence, are not reported. The actual incidence of the disease is underestimated owing to the non-reporting of asymptomatic cases. Mathematical models for incidence and prevalence assessment largely help in overcoming these challenges. [5] Hence, the present study estimated the dengue incidence trend in the Rohtas based on routine data from the Outpatient department of medicine.

Material and Methods

The prospective observational clinical trial was conducted to estimate the dengue incidence trend in the Rohtas based on routine data from the Outpatient department of medicine The study subjects were recruited from the patients visiting the Outpatient Department, Department of General Medicine, Narayan Medical College and Hospital Jamuhar Sasaram.

The present study included a total of 600 subjects within the age range of 0 years to 70 years and a mean age of 34.8 years. The study included both males and females. The data collection was the epidemiological and laboratory data from the hospital records of the patient attending the outpatient department with a history of fever. After final inclusion, the study subjects were divided into age groups of 1200 patients were categorized into eight age groups as 0-2 years, 2-9 years, 10-19 years, 20-29 years, 30-39 years, 40-49 years, 50-59 years and 60 years above. The clinical and laboratory data collected from the medical records were arranged based on gender and age. Dengue prevalence positivity of symptoms and signs, and laboratory findings were arranged by percentage and the results were formulated.

Results

The prospective observational clinical trial was conducted to estimate the dengue incidence trend in the Rohtas dist. based on routine data from the Outpatient department of general medicine Study duration is Two years. The present study included a total of 600 subjects within the age range of 0 years to 70 years and a mean age of 34.8 years. The study included both males and females. The age and gender-related characteristics of the study subjects are described in Table 1. Patients were divided into 0-2, 2-9, 10-19, 20-29, 30-39, 40-49, 50-59 and 60 years above age groups.

Among 243 adult males, 70 (28.80%) and among 357 adult females, 170 (24.08%) were found to be suffering from dengue infection. Fever, nausea vomiting, rashes, generalized pain, lethargy, liver enlargement, mucosal bleeding, abdominal pain, low WBC count, low platelet, NS1 antigen IgM, and IgG were seen in 357, 190, 161, 228, 285, 90, 88, 142, 143, 145, 85, 85, and 85 females

respectively with the highest frequency in age groups of 0- 19 years. These respective values in males were 96, 71, 123, 166, 116, 73, 31, 16, 106, 69, 78, and 69 cases

respectively (Table 1). Concerning dengue positivity, there were 156 dengue positive cases and 444 dengue negative cases. In age group of 0-2, 2-9, 10-19, 20-29, 30-39, 40-49, 50-59 and 60 years above, there were 14.10% (n=22), 19.87% (n=310, 16.66% (n=26), 14.10% (n=22), 10.25% (n=16), 8.97% (n=14), 10.89% (n=17), and 5.12% (n=8) subjects respectively. This shows maximum cases in 0-19 years of age and decrease incidence with increasing age as shown in Table 2.

Table 1: gender and age-wise distribution of dengue associated factors in study subjects

Characteristics	Age (years)								Gender	
	0-2	2-9	10-19	20-29	30-39	40-49	50-59	>60	Males	Females
Fever	79	141	107	93	55	45	47	33	243	357
Nausea Vomiting	34	72	54	39	28	17	26	16	96	190
Rash	17	29	89	26	24	21	6	11	71	161
Generalized pain	32	44	106	75	28	27	22	17	123	228
Lethargy	58	100	100	87	31	31	17	27	166	285
Liver Enlargement	29	32	38	17	22	12	10	3	116	90
Mucosal Bleeding	11	18	28	11	17	9	6	16	73	88
Abdominal Pain	28	33	39	20	28	10	3	3	31	142
Low WBC Count	28	28	84	27	33	29	22	28	16	143
Low Platelets	34	30	25	32	24	18	20	17	106	145
NS1 Antigens	23	31	21	20	19	14	18	7	69	85
IgM	25	34	28	18	17	10	16	5	78	85
IgG	24	32	28	17	16	11	14	5	69	85

Table 2: Dengue positivity in study subjects based on gender and age-wise distribution

Characteristic	Age Group [Years]	Dengue Positive (n=156)	Percentage (%)	Dengue Negative(n=444)	Percentage (%)
Age	0-2	22	14.10	53	12
	2-9	31	19.87	106	24
	10-19	26	16.66	84	19
	20-29	22	14.10	78	17.56
	30-39	16	10.25	42	9.45
	40-49	14	8.97	31	7
	50-59	17	10.89	27	6
	60 or above	8	5.12	23	5
Gender	Males	70	44.87	177	39.86
	Females	86	55.12	267	60.14

Discussion

The prospective observational clinical trial was conducted to estimate the dengue incidence based on routine data from the Outpatient department of medicine. The present study included a total of 600 subjects within the age range of 0 years to 70 years and a mean age of 34.8 years. The study included both males and females. Patients were divided into 0-2, 2-9, 10- 19, 20-29, 30-39, 40-49, 50-59 and 60 years above age groups. These findings were similar to the studies by Kakkar M et al [6] in 2012 and Burniol J et al [7] in 2011 where authors reported comparable results. Among 243 adult males, 70 (28.80%) and among 357 adult females, 170 (24.08%) were found to be suffering from dengue infection. Fever, nausea vomiting, rashes, generalized pain, lethargy, liver enlargement, mucosal bleeding, abdominal pain, low WBC count, low platelet, NS1 antigen IgM, and IgG were seen in 357, 190, 161, 228, 285, 90, 88, 142, 143, 145, 85, 85, and 85 females respectively with the highest frequency in age groups of 0-19 years. These respective values in males were 96, 71, 123, 166, 116, 73, 31, 16, 106, 69, 78, and 69 cases respectively. These findings were in agreement with the findings of Fischer D et al [8] in 2010 and Chakravarti A et al [9] in 2012 where similar clinical features were discussed by the authors.

Concerning dengue positivity, there were 156 dengue positive cases and 444 dengue negative cases. In age group of 0-2, 2-9, 10-19, 20-29, 30-39, 40-49, 50-59 and 60 years above, there were 14.10% (n=22), 19.87% (n=310, 16.66% (n=26), 14.10% (n=22), 10.25% (n=16), 8.97% (n=14), 10.89% (n=17), and 5.12% (n=8) subjects respectively. This shows maximum cases in 0-19 years of age and decrease incidence with increasing age. These findings were consistent with the findinds of Mustafa MS et al [10] in 2015 and Aguiar M et al [11] in 2015 where positivity rates were comparable to the present study.

Conclusion

Within its limitations, the present study concludes that dengue incidence decrease with increasing age. Such studies assessing seroprevalence should be conducted on regular basis to assess a clear picture of the dengue burden in Rohtas Bihar. A higher female population was seen in the present study with the highest dengue positivity in the 0-19 year age group. However, the present study had few limitations including smaller sample size, shorter monitoring period, geographical area biases, and single- institutional nature. Hence, further longitudinal studies with a larger sample size and longer monitoring period are required to reach a definitive conclusion.

References

1. Hallett TB. Estimating the HIV incidence rate: recent and future developments. Curr Opin HIV AIDS. 2011;6 (2):102–7.
2. World Health Organization. Geneva, Switzerland: WHO; 2009. Dengue: guidelines for diagnosis, treatment, prevention, and control.
3. Randolph SE, Rogers DJ. The arrival, establishment, and spread of exotic diseases: patterns and predictions. Nat Rev Microbiol 2010; 8: 361 –71.
4. Ramakrishnan SP, Geljand HM, Bose PN et al. The epidemic of acute hemorrhagic fever, Calcutta, 1963; epidemiological inquiry. Indian J Med Res 1964; 52: 633–50.
5. Brady OJ, Gething PW, Bhatt S et al. Refining the global spatial limits of dengue virus transmission by evidence-based consensus. PLoS Negl Trop Dis 2012; 6: e1760.
6. Kakkar M. Dengue fever is massively underreported in India, hampering our response. BMJ. 2012 Dec 19; 345.
7. Barniol J, Gaczkowski R, Barbato EV, da Cunha RV, Salgado D, Martı´Nez E, et al. Usefulness and applicability of the revised dengue case classification by disease: a multi-center study in 18 countries. BMC Infect Dis. 2011; 11:106.
8. Fischer D, Thomas SM, Beierkuhnlein C. Temperature-derived potential for the establishment of phlebotomies and flies and visceral leishmaniasis in Germany. Geospatial Health 2010; 5:59 –69.
9. Chakravarti A., Arora R. & Luxemburger C.

Fifty years of dengue in India. Trans R Soc Trop Med Hyg 2012; 106, 273–82.

10. Mustafa MS, Rastogi V, Jain S et al. Discovery of fifth serotype of dengue virus (DENV-5): a new public health dilemma in dengue control. Med J Armed Forces India2015; 71: 67–70.

11. Aguiar M, Rocha F, Pessanha JEM et al. Carnival or football, is there a real risk for acquiring dengue fever in Brazil during holiday seasons? Sci Rep 2015; 5: 8462.