

TIME-TREND ANALYSIS OF DENGUE FEVER IN JAIPUR – A RECORD-BASED STUDY

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Received: 27 January 2023, Revised and Accepted: 05 March 2023

ABSTRACT

Objective: Dengue is a vector-borne disease and is a major public health threat globally. The number of dengue cases reported to the World Health Organization increased over 8 fold over the past two decades, from 505,430 cases in 2000 to 5.2 million in 2019. The total number of cases seemingly decreased during years 2020 and 2021, as well as for reported deaths. However, the data are not yet complete and COVID-19 pandemic might have also inhibited case reporting in several countries. This record-based study was planned to study the annual and seasonal trend of dengue fever (DF) and effect of COVID-19 on reporting of DF.

Methods: The record-based analysis was done by collecting data from the CMHO after taking informed consent from the Chief Medical and Health Officer, Jaipur. Data from the past 5 years (i.e., 2017–2021) were collected to study the annual and seasonal trends of dengue in Jaipur. Descriptive statistics was expressed in percentage and proportions. Data were entered in Microsoft Excel and analyzed using Epi info version 7.2.2.6 (software).

Results: The number of cases increased from 2017 to 2018 with a slight decrease in 2019. There is sudden decrease in the number of cases from 2019 to 2020 which clearly shows the effect of COVID-19 pandemic. It was noticed that the number of cases starts increasing from August and reaches a peak in October and then starts decreasing.

Conclusion: Dengue is present throughout the year but becomes a public health problem in the third quarter of year. Under-reporting of dengue cases and similar clinical presentation as COVID-19 made situation more difficult in its diagnosis and management that ultimately results in less cases reported in 2020.

Keywords: Dengue, Dengue trend, Rajasthan

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INTRODUCTION

Dengue is a vector-borne disease that is a major public health threat globally. It is caused by the dengue virus (DENV, 1–4 serotypes), which is one of the most important arboviruses in tropical and subtropical regions [1]. DENV causes a wide range of diseases in humans, from dengue fever (DF) which is an acute febrile illness to dengue hemorrhagic fever or dengue shock syndrome which is life threatening [2]. The first case of dengue in India was first reported in Chennai in 1780, and the first outbreak occurred in Kolkata in 1963; subsequent outbreaks have been reported from different parts of India [3]. The number of dengue cases reported by the World Health Organization increased over 8 fold over the past two decades, from 505,430 cases in 2000 to 5.2 million in 2019. Reported deaths between the year 2000 and 2015 increased from 960 to 4032, affecting mostly young people. The total number of cases decreased during years 2020 and 2021, as well as for reported deaths. However, the data are incomplete and COVID-19 pandemic might have also hampered case reporting in several countries [4].

The overall seroprevalence of dengue infection in India was 48.7% (95% CI: 43.5–54.0); increasing from 28.3% (21.5–36.2) among children aged 5–8 years to 41.0% (95% CI: 32.4–50.1) among children aged 9–17 years and to 56.2% (95% CI: 49.0–63.1) among individuals aged 18–45 years [5].

High dengue burden and frequent outbreaks result in a serious drain on economy and stress on the health system of the country. Dengue is a notifiable disease under Integrated Disease Surveillance Project. In India, case detection, case management, and vector control are the main strategies for the prevention and control of dengue virus transmission [6].

This record-based study was planned to study the annual and seasonal trend of DF and effect of COVID-19 on reporting of DF. These results will help us to implement appropriate control measures on time and to implement early diagnosis and reporting.

METHODS

The record-based analysis was done by collecting data from the CMHO after taking informed consent from the Chief Medical and Health Officer, Jaipur. Data from past years, i.e., 2017–2021 were collected to study the annual and seasonal trends of dengue in Jaipur. Descriptive statistics were expressed in percentage and proportions. Data were entered in Microsoft Excel and analyzed using Epi info version 7.2.2.6 (software).

RESULTS

Figure 1 shows the total number of cases in a year from 2017 to 2021. From the graph, we can see the number of cases increased from 2017 to 2018 with a slight decrease in 2019. There is sudden decrease in the number of cases from 2019 to 2020 which clearly shows the effect of COVID-19 pandemic.

Table 1 shows the seasonal trends of DF. For each year, it has been noticed that the number of cases starts increasing from August and reaches a peak in October and then starts decreasing. These are post-monsoon months which showed possibility of increase in number of mosquito breeding site and number of cases.

DISCUSSION

In recent years, dengue has shown an increasing trend in the number of cases in the country, therefore requiring urgent public policies to curb the disease [7]. The analysis of time trend of DF clearly shows decrease

Table 1: Seasonal trends of dengue fever

Months	2017	2018	2019	2020	2021
January	5	194	90	9	15
February	1	166	27	7	30
March	0	117	86	9	17
April	1	77	65	6	17
May	1	63	37	4	9
June	17	105	69	3	0
July	15	99	78	2	3
August	190	121	183	5	21
September	209	450	329	19	149
October	918	1805	1105	32	863
November	639	671	1500	29	734
December	152	253	160	16	
Total	2148	4121	3729	141	1858

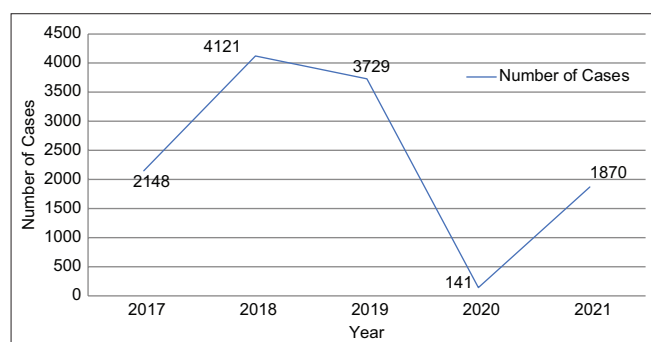


Fig. 1: Trend analysis of dengue fever

in the number of cases during COVID-19. This sudden decrease in the number of dengue cases could be due to under-reporting of dengue cases and decrease outside mobility due to lockdown during COVID-19. During 2020, maximum of health resources from almost all the National Health Programs were drawn and utilized in combating COVID-19 pandemic which side-tracked the surveillance, diagnosis, and treatment of other diseases, including dengue. One of the reasons for under-reporting of dengue could be due to its similar clinical picture with COVID-19. Both exhibit non-specific presentations, including fever, headache, abdominal pain, malaise, and nausea. Not only clinical features but they also have similar laboratory findings such as leukopenia and thrombocytopenia, which put makes the diagnosis more difficult [8].

The present study showed the seasonal trends of DF. The number of cases starts ascending in the month of August and reaches a peak in October and then starts descending. Similar studies from different parts of the country including Rajasthan [3], Delhi [9], and Gujarat [10]. Rainfall was significantly related to dengue as precipitation provides habitats for the aquatic stages of the mosquito life cycle and strongly influences vector distribution [11]. Rajasthan received highest rainfall during the month of September, which was 176% of LPA (long period average) [12]. This temporality explains the peak in dengue cases during October.

CONCLUSION

Dengue is present throughout the year but becomes a public health problem from August to October. Underreporting of dengue cases and similar clinical presentation as COVID-19 made the situation worse and that ultimately resulted in less cases reported in 2020. Both temperature and rainfall are contributing factors for the spurge of cases post-monsoon. Therefore, the need of the hour is to understand this public health problem and act in time.

CONFLICT OF INTEREST

None.

AUTHOR'S FUNDING

None.

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