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Dengue patient's body post-treatment may provide some antibodies that help fight covid-19: A survey-based study

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ABSTRACT

The number of corona infections in India is rising quickly, yet those who have had dengue have been found to have developed internal immunity that helps them fight against corona. A community diagnosis survey was carried out in Jodhpur, Rajasthan, India, in an urban practice area. A survey was conducted to find out the health state and sociodemographic characteristics of one hundred dengue patients. Data regarding their present state of health was collected. The right tools were used to analyse the data. Using Student's Z-test and T-test statistical analysis, the relationship between COVID-19 and dengue was examined. At $P < 0.50$, statistical significance was established. In the general survey, corona infection did not follow dengue. Among the 27 dengue patients under study, the median age of the population was 69% under the age of 19–27, 20% over the age of 28–40, and 3% of the patients were female and between the ages of 41 and 55. 43 (43%), compared to 56 (56%) were less likely. A set of questions was posed to 100 dengue patients, with a statistical significance limit of $p < 0.50$. It was determined from this study that none of the patients who had previously had dengue had corona infection. According to our research, the majority of men and women aged 19 to 27 who have dengue are not at risk of developing corona. We can also conclude that during dengue recovery, the body produces certain antibodies which help in the fight against corona and stop the virus from spreading.

1. Introduction

A new study analyzing the COVID-19 outbreak in India has established a link between the spread of the virus and previous outbreaks of dengue fever, suggesting exposure to the mosquito-transmitted disease. This may provide some level of immunity against COVID-19. The maps of the ongoing dengue epidemic and the COVID-19 pandemic do not overlap in global severity. Countries with high dengue endemism (>1.5 million cases/year) are less affected by COVID-19 in terms of infection, transmission and mortality. Based on the non-overlap of dengue and COVID-19 severity maps in general and the growing evidence of SARS-CoV-2 false-positivity in dengue antibody tests, we wonder whether dengue virus (DV) in highly dengue endemic countries denv) appears to provide some degree of protection against COVID-19 severity.[1] SARS-CoV-2 pandemic and recurrent dengue epidemics in tropical countries have turned into a global health threat even though both virus-caused infections may only reveal light symptoms, they may also cause severe diseases.[2] The limited access to specific diagnostic tests for each disease differentiation between dengue and COVID-19 diagnoses is a challenge in tropical regions because of the similarity of symptoms and[3] Dengue virus infection affecting around 100 countries in the world and has become a global threat.[4] Dengue virus (DENV) is a member of

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the Flavivirus genus of single-stranded positive-sense RNA viruses that cause visceral and central nervous system disease in humans. DENV cycles in nature between humans and its two principal mosquito vectors (Aedes albo- pictus or Aedes aegypti).[5] Dengue viruses are spread to people through the bites of infected Aedes aegypti mosquitoes.[6] Sudden dengue begins after an incubation period of 5–7 days (range, 3–10 days), and the course follows 3 phases: febrile, severe, and convalescing. Fever lasts for 2-7 days and may be bipartite. The most common symptom of dengue is fever with any of the following: Nausea, vomiting, Aches and pains (eye pain, typically behind the eyes, muscle, joint, or bone pain), Rash Symptoms of dengue typically last 2–7 days.[6] In Wuhan City, Hubei Province, China, early December 2019, an outbreak of coronavirus disease 2019 (COVID-19), caused by a novel severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2), occurred RNA viruses are non-fragmented positive-sense coronaviruses that belong to the family Coronaviridae and order Nidovirales and are broadly distributed in humans and other mammals.[7] It is said that the virus that causes COVID-19 is mainly spread through respiratory droplets when an infected person coughs, sneezes or talks.[6]

The time taken by the symptoms to first appear on an infected individual. The incubation time for covid-19 commonly being around 5 days and ranges from 1-14 days**.** Common symptoms of SARS included cough, dyspnea, fever and occasionally watery diarrhea.[8] SARS-CoV-infected patients recovered spontaneously without clinical intervention, while a small percentage succumbed to the disease. Here, we have described N protein-specific and S glycoprotein-specific neutralizing antibodies (NAbs) to characterize temporal changes in responses in infected patients who have either recovered from or succumbed to SARS-CoV infection. High and sustained levels were found for both N protein-specific and S glycoprotein-specific NAb responses in recovered patients, suggesting that antibody responses potentially play an important role in determining the final disease outcome of SARS-CoV-infected patients.[9] Due to the potential for severe acute respiratory syndrome coronavirus (SARS-CoV) to re-emerge, efforts are being made to develop a vaccine for control and prevention as a prophylactic strategy. Dengue virus, feline coronavirus and HIV virus take advantage of the anti-viral humoral immune response to infect host target cells. This is a mechanism of antibody-dependent enhancement (ADE).[10] Antibodies to protective and beneficial are generally, ADE phenomenon has been documented for dengue virus and other viruses. In SARS-CoV infection, ADE is mediated by the engagement of Fc receptors (FcRs) expressed on various immune cells, including monocytes, macrophages and B cells.[11] Not only the respiratory tract but also the gastrointestinal tract and other organ systems are involved in infection with SARS-CoV. Other reports have highlighted direct SARS-CoV infection of hematopoietic cells. How the virus enters immune cells that do not express the SARS-CoV receptor angiotensin converting enzyme 2 (ACE2) is unclear. Immune mediated infection and, in particular, antibody dependent enhancements (ADE) are known to be exploited by a variety of viruses, such as dengue virus, HIV, and animal coronaviruses.[12]

2. Materials and Methods

We conducted this study for an urban practice area community diagnosis survey conducted by Jodhpur, Rajasthan (India). Corona cases are increasing rapidly in India, but we have seen that people who have had dengue have developed immunity to fight against corona, this helps them to fight against corona. A group of 100 dengue patients were surveyed for their health status and socio-demographic factors. Information was collected about their current health status, condition etc. Data was analyzed by appropriate tools. To study the effective factors in fighting dengue patients' immunity after recovery from dengue in the body of dengue patients and with respect to dengue patients across the country; we selected, surveyed and interrogated them for having dengue. Later got infected with Covid-19. If this happens, then after recovering from Covid-19, your body's immunity has helped in fighting Covid-19. A questionnaire survey was used in this cross-sectional study. The questionnaire included items related to Demographics, from health professionals during health care Understanding the corona virus, and the facts behind why a dengue patient did not get infected with the corona virus. Information gathered on demographics includes age, gender; the average duration of consultation in relation to the formation of antibodies in the body of dengue patients in Covid-19 was recorded Participants' self-reports. Plus, We Asked Dengue Patients if health professionals had informed them about the following questions and if they understand them. The 4 questions were: 1) Are you infected with Dengue, 2) Have you been infected with Corona after being infected with Dengue, 3) If you treated with dengue then you infected with Covid-19, 4) If yes, was your body's immunity effective in fighting corona when you recover after being infected with dengue.

2.1. Statistical analysis

The association between Covid-19 and dengue was analyzed using the Student's t-test. Statistical significance was set at $p < 0.50$.

3. Result and Discussion

We had selected 100 dengue patients in this survey. In this survey, 56 percent were men and 43 percent were women. The average age of the population 27 was of the dengue patients studied, 69% were under the age of 19–27 years

and about 20% were over the age of 28–40 years, 3% were 41–55 years old and women were 56 (56%) to 43 (43%) more likely. We asked some questions to 100 dengue patients, such were the questions. Statistical significance $p < 0.50$. The approximate p-value for t test for 6 observations, Table t test for tail probability $p = 0.50$.

Table 1: Have you been infected with dengue.

Age	Yes 19-27	No 19-27	Yes 28-40	No 28-40	Yes 41-55	No 41-55	Mean
X_1 Male	25	14	10	2	3	1	0.35
X_2 Female	27	8	4	2	0	1	0.42

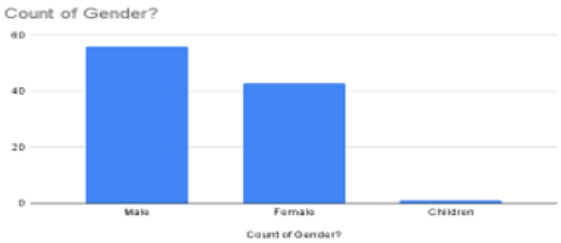

Figure 1: Count of gender

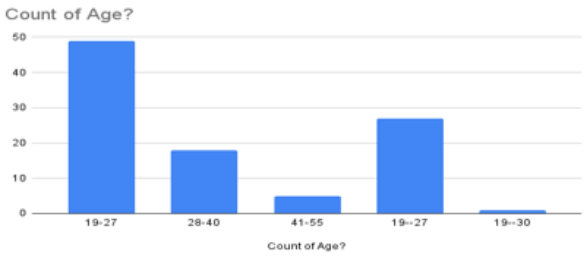

Figure 2: Count of age.

3.1. Are you infected with dengue?

So, we found that 72% of dengue patients answered yes and 28% no. The mean of a 27-year-old male and a 27-year-old female participated and the t test value of the first question is 0.154 and the Table 1 of the t test was obtained for the tail probability value $p < 0.50$

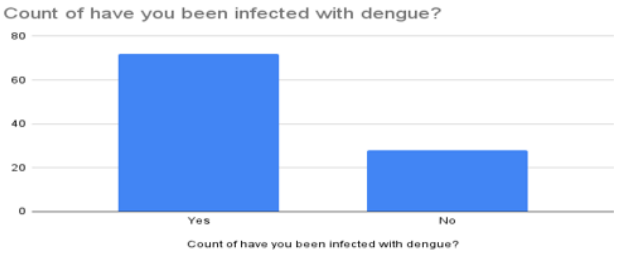

Figure 3: Court of have you been infected with dengue ?

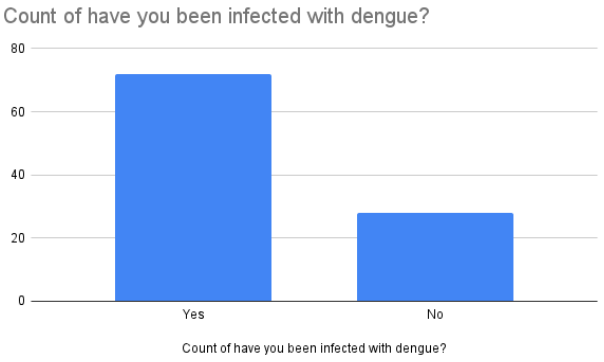

Figure 4: Count of have you been infected with dengue

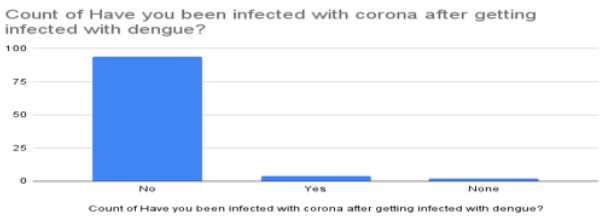

Figure 5: Count of have you been infected with corona after getting infected with dengue.

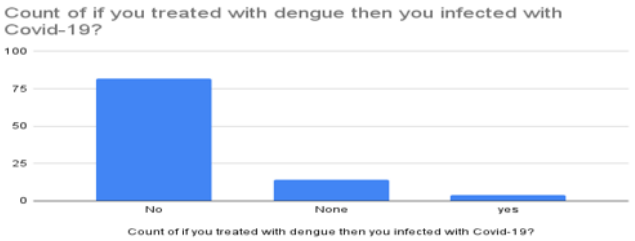

Figure 6: Count of if you treated with dengue then you infected with covid-19.

Table 2: Have you been infected with corona after being infected with dengue?

	Age	Yes 19-27	No 19-27	Yes 28-40	No 28-40	Yes 41-55	No 41-55	Mean
X_1	Male	1	38	1	11	0	4	0.55
X_2	Female	3	31	0	3	1	2	0.40

Table 3: If you treated with dengue then you infected with Covid-19?

	Age	Yes 19-27	No 19-27	Yes 28-40	No 28-40	Yes 41-55	No 41-55	Mean
X_1	Male	3	39	0	12	0	4	0.58
X_2	Female	1	34	0	6	0	1	0.42

Table 4: If yes, was the immunity built up in your body effective in fighting corona when you recover after being infected with dengue?

	Age	Yes 19-27	No 19-27	Yes 28-40	No 28-40	Yes 41-55	No 41-55	Mean
X_1	Male	5	36	3	8	1	3	0.56
X_2	Female	3	33	2	5	0	1	0.44

Table 5: Statically result with experiment details.

S. No	Questionnaire	Standard Deviation	Test Statistic	P Value
1	Are you infected with Dengue?	3.24	0.154	0.50
2	Have you been infected with corona after being infected with dengue?	3.71	0.3	0.50
3	If you treated with dengue then you infected with Covid-19?	3.93	0.3	0.50
4	If yes, was the immunity built up in your body effective in fighting corona when you recover after being infected with dengue?	3.67	0.23	0.50

Figure 7: If yes, was the immunity built up in your body effective in fighting corona when you recover after being infected with dengue?

3.2. Have you been infected with corona after being infected with dengue?

In the second question 94% answered no and 4% answered yes and 2% they didn't answer. The mean of a 29-year-old male and a 37-year-old female participated, t test value of first question is 0.3 and Table 2 of the t test obtained for tail probability value $p < 0.50$

3.3. If you treated with dengue then you infected with Covid-19?

In the third question 82% answered. No, 4% answered yes and 14% they didn't answer. The mean of a 35-year-old male and a 33-year-old female participated; the t test value of the first question is 0.3 and the Table 3 of the t test for the tail probability value $p < 0.50$

3.4. If yes, was the immunity built up in your body effective in fighting corona when you recover after being infected with dengue?

In the fourth question, 68% they didn't answer. because they were not infected with corona after dengue, and 14% answered yes and 18% did not. The mean of a 33-year-old male and a 31-year-old female participated, the t test value of the first question is 0.3 and the Table 4 of the t test for the tail probability value $p < 0.50$

So now we can say that antibodies are made in patients who had dengue and that antibody proves to be effective in fighting corona in dengue patients somewhere, and we can also say that people who have dengue, the risk of getting infected with corona in them is low. This study has some limitations this study was done in a community in Rajasthan, people who have had dengue before have a low risk of covid-19 during the corona period, the newborn was excluded from this study. Since this study was conducted

on men and women from adult to old age, these limitations should be considered in the interpretation of the study results.

4. Conclusion

In latest study analyzing Covid-19 outbreaks in Rajasthan (India) has found a link between the spread of the virus and previous outbreaks of dengue fever, which suggests that the spread of the mosquito-transmitted disease is likely to be associated with this research. In this survey it was found that not all patients who have had dengue before have been infected with corona. Exposure to dengue may provide some level of immunity against COVID-19. We found in our research that most of the men and women in the age group of 19-27 are not at risk of getting infected with corona after dengue, and we can also say that after recovering from dengue, some antibodies are formed in the body which helps in corona infection. Although little work has been done on this study and there is room for further scientific investigation. This research showed that dengue may confer some immunity against COVID-19. It is necessary to accumulate this indigenous knowledge through proper documentation and preserve it for future research. More research is needed on people who have dengue antibodies in their blood that can falsely test positive for COVID-19 antibodies, even if they have never been infected with the Covid-19.

5. Data Availability Statement

We do not wish to share our data before we have thoroughly analyzed. All data sources described in the study are directed at the corresponding author.

6. Ethical Approval

Ethical approval turned into now no longer required for this letter. All facts used are publicly accessible.

7. Source of Funding

None.

8. Competing Interest

All authors are, do now no longer record any conflicts of hobby with inside the writing of this letter.

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