A CROSS-SECTIONAL STUDY ON TREATMENT AND PREVENTIVE MEASURES OF DENGUE FEVER

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ABSTRACT

Objective: The Arbovirus known as dengue belongs to the Flaviviridae class. Asymptomatic to severe illnesses (dengue haemorrhagic fever/dengue shock syndrome) are the clinical spectrum of its expression. Despite the fact that this condition has been subject of extensive investigation, there is currently no cure. The goal of current study was to describe socioeconomic determinants and knowledge, attitude, and practice status of dengue treatment among population of Pakistan. **Methods:** From March 2023 to January 2024, cross-sectional survey involving 252 randomly chosen participants from various regions of Karachi were carried out. Systematic questionnaire was utilized to gather information about participant's sociodemographic traits and their understanding of dengue fever and their practices for treating it. Factors related to awareness and comprehension of dengue were looked into independently by using IBM SPSS Statistics 20. **Results:** The majority of respondents were aware of dengue, yet they continued to have false beliefs about the areas where Aedes breeds. Misconceptions about Aedes breeding in unclean water were held by around half of the survey participants, and some were aware that Aedes bites most frequently at dawn and dusk. The level of preventative activity was marginally lower than the level of knowledge, despite a substantial (p<0.05) correlation between the two. **Conclusion:** As dengue spreads in Pakistan, it is critical to step up health promotion efforts by launching campaigns to dispel widespread misconceptions and information gaps regarding the disease and its treatment.

Keywords: Arbovirus, *Flaviviridae*, Preventive measures, DENV, Aedes, Cure, Dengue Hemorrhagic Fever, Dengue Shock Syndrome.

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INTRODUCTION

Dengue fever is a viral infection transmitted by mosquitos, specifically Aedes aegypti and Aedes albopictus, in tropical and subtropical regions. It affects millions of people worldwide and causes symptoms ranging from mild to severe, such as high fever, headache, body aches, nausea, and rash. While most cases recover on their own, severe dengue can be life-threatening and necessitate hospitalisation. Early discovery and access to appropriate medical care are critical for reducing fatality rates. With no specific therapy available, preventative methods such as mosquito control, personal protective equipment, and vaccine (in some countries) are critical in combating dengue. Awareness and public health measures are critical to mitigating the impact of this serious public health hazard. There is currently no known cure for DENV; previous promising vaccination options have simply been found to be useless [1]. However, quick diagnosis followed by focused vector control measures reduces DENV transmission, and it has been suggested that early discovery followed by supportive care may reduce fatality rates from 20–20% to less than 1% [2]. In many endemic places, public health officials will publish notifications in neighbourhood newspapers, broadcast announcements over the radio, and even close schools and other public facilities during peak transmission as an effort to reduce possible exposure. The use of pesticide sprays and the eradication of all

mosquito breeding grounds (including locations with standing water, especially in schools) are further protective measures [3]. Dengue Hemorrhagic Fever (DHF) and Dengue shock Syndrome (DSS) have the capacity to be fatal and result in patient death. Pakistan's highly populated cities, tainted water supplies, inadequate sanitation, sizable refugee population, and low immunisation rates make it extremely susceptible to dengue endemics [4]. As of right now, there is no suitable animal model for DHF/DSS, and a tetravalent vaccination is required for full protection against all four serotypes. As a result, developing a dengue vaccine is quite challenging. In an effort to eradicate dengue virus infection, many antiviral drugs are now being tried; still, a safe, effective, and economical vaccine that can combat all four dengue serotypes is still required. In its most severe forms, dengue fever poses a serious risk to a patient's life [5]. Breakbone fever, often known as dengue fever, is brought on by a virus that is spread by Aedes mosquitoes. Body pains and a high fever are symptoms. Haemorrhagic fever and shock can be symptoms of severe dengue. It may be potentially fatal and requires immediate medical attention [6]. Some sign and symptoms of dengue included: sudden onset of a fever, severe headache in the front, Eye movement makes the pain behind the eyes worse, joint and muscle discomfort, appetite and sense of taste decline, Measles-like rash covering the chest and upper limbs, nausea and diarrhoea. Dengue fever can manifest as a straightforward, self-limiting sickness or a patient may develop Known as Dengue Hemorrhagic Fever (DHF), bleeding tendencies, DHF is a serious illness can induce Dengue Shock Syndrome (DSS), a type of the disease that can be fatal [7]. The first step in prevention is awareness. If someone is heading to an area where dengue infection is prevalent, they should make sure they are aware of the danger and be prepared to protect themselves [8]. Since Ades aegypti mosquitoes lay their eggs in the walls of water containers and breed near bodies of water, these insects are frequently found close to water cisterns, unprotected septic tanks, decorative fountains, abandoned tires, bottles, boats, and other stationary vehicles that may collect water [9].

MATERIALS AND METHODS

A standardized questionnaire that was created after a thorough assessment of the literature and discussions with faculty members to perform a descriptive, cross-sectional study. The Ethics Committee of Hamdard University examined and approved the study protocol. Every participant was fully aware of the study's objectives. ERC number of the study is ERC-FoP-2023-002. A survey with a research sample of 393 participants was calculated using this link https://www.openepi.com/SampleSize/SSPropor.htm details available in **Table 1**.

The questionnaire's items underwent preliminary testing. The questionnaire was divided into four primary sections: sociodemographic, dengue knowledge, treatment of dengue and its prevention strategies. All variables in the current study were evaluated using IBM SPSS Statistics 20. The data reliability was tested with the Cronbach's Alpha reliability test, which should be equal to or more than the value of 0.7. Cronbach's Alpha value of this study can be viewed in **Table 2**.

Table 1: Socio-demographic data.

Gender	Number	Percent (%)
Male	201	51.14
Female	192	48.85
Age		
<30	303	77.1
30-40	86	21.9
41-50	2	0.50
>50	2	0.50
Education		
Illiterate	52	13.2
Primary	33	8.4
Secondary	32	8.1
University	276	70.02
Total	393	100

Table 2: Reliability test of study.

Cronbach's Alpha	No. of Items
0.703	25

RESULTS

In present study 51.14% male and 48.85% female take part details are in Table-1. Current cross-sectional research shows that 58.01% of Karachi residents are aware about outbreak season of dengue. And 11.95% male female knew nothing about the dengue outbreak as shown in **Table 3**. Another question was asked about the target organ by dengue virus, Sixty-one percent of respondents indicated they were aware that the liver is the organ primarily affected by the virus. 39% of the general public did not know about the targeted organ, can be seen in **Table 3**. Additional questions about the public's understanding of DF, such as duration of fever in sickness and fever signs and symptoms, were included in the questionnaire. 43.48% of respondents incorrectly indicated that the DF cycle lasted 4-10 days and 56.52% said correctly the time span of fever which is 2-7 days, as shown in table-3. It is estimated that 11.95% of individuals are known about the fever as sign of dengue and 52.66% said major indication of dengue is joint pain and 34.35% said its muscles pain. Responses to questions concerning the treatment of DF lacked a clear understanding of the topic. The general public (10.4%) expressed influence over the usage of medications such as aspirin, diclofenac, naproxen, and mefenamic acid to control DF, however some individuals (24.9%) are aware that DF can be controlled by maintaining continuous hydration, details given in **Table 4**. When it comes to the strategies that should be employed to prevent DF, the people gave mixed answers as they use mosquito sprays (12.0%), liquid vaporizers (7.9%), they regularly clean garbage (7.6%) and 25.7% said they used different things to prevent from virus as shown in **Table 5**. When a question asked by respondents that for prevention of children from this lethal virus should they use oil of Eucalyptus for children, then respondents gave their response as 44.3% said yes, they will use this oil and 24.7% said they will not give and 31% said they don't know about this, can be viewed in table-5. Another question about treatment was asked that Goat Milk, Papaya Leaves, and Kiwi Fruit Effective in increasing the Platelet Count, response is as follow: 49.3% said yes, 35.87% said no and 4.04% didn't know about these, details given in **Table 5**.

Table 3: Knowledge regarding dengue prevention.

Variables		Male %	Female %	Total %
Dengue outbreak Time	After rain peak from august to October	29.77	28.2	58.97
	Don't know	4.8	7.1	11.9
Organ That Dengue Targets the Most?	Liver	31.2	29.77	60.97
Time-Span of Fever in Dengue?	2-7 days	32.06	24.46	56.52
Dengue fever signs and symptoms	Fever	8.65	3.30	11.95
	Joint pain	26.20	26.46	52.66
	Muscle pain	16.03	18.32	34.35

Table 4: Attitudes regarding dengue prevention.

Variables		Male %	Female %	Total
Mode of dengue fever transmission	Black mosquitoes	9.66	22.39	32.05
	Contacted with infected patient	2.29	3.56	5.85
	Blood transfusion	2.29	0	2.29
Consequence of Untreated Dengue?	Breathing Problem	12.21	4.07	16.28
	Internal bleeding, Organ damage	7.63	5.08	12.71
	Death	12.97	15.26	28.23
Measures to Recover Quickly from Dengue?	Maintains body hydration	18.32	6.36	24.68
	Drug aspirin, Diclofenac, Naproxen, Mefenamic acid	6.61	3.81	10.42
Rest is important in Dengue?	Yes	40.71	39.44	80.15
	No	5.85	3.56	9.41

Table 5: Practices regarding dengue prevention.

Variables		Male %	Female %	Total
Methods use to prevent from the dengue?	Mosquito mat/coil/liquid vaporizer	9.92	2.03	11.95
	Cleaning of Garbage	4.07	3.5	7.63
	Prevent water stagnation	0.7	3.30	4.0
Insect repellents acceptable to use?	Diethyltoulamide	12.21	0.25	12.46
	Diethyl methyl benzamide	5.59	7.63	13.22
	PMD	8.65	12.97	21.62
	Don't know	16.03	18.06	34.09
Can repellents containing PMD (para-menthane-3,8-diol) or (OLE) oil of lemon eucalyptus use in children?	Yes	27.73	16.53	4.26
	No	12.21	12.46	24.67
	don't know	11.19	19.84	31.03
Steps to lower the chance of contracting dengue?	Reducing the amount of stagnant water	33.07	22.13	55.20
	Spray insects Repeller's continuously	11.95	13.48	25.43
	Don't know	3.05	6.36	9.41
Antibiotics can used to treat dengue?	Yes	25.19	27.98	53.17
	No	17.30	12.46	29.76
Goat Milk, Papaya Leaves, and Kiwi Fruit Effective in Increasing the Platelet Count?	Yes	26.20	23.15	49.35
	No	16.28	19.59	35.87
	Don't know	3.30	0.7	4.06

DISCUSSION

To have the biggest impact on curing the disease, public policies that successfully address the factors that lead to disease transmission with the vector at the centre of the strategy should be supported and reinforced [10]. The majority of participants in a previous study, 522 (85.9%), said they knew about dengue. The community's rate of adequate dengue knowledge was only 32.4%. According to this cross-sectional study, 86.11% of Karachi locals know how to avoid contracting dengue fever. Zamri et al. reported that students at IIUM Kuantan had a reasonable degree of dengue knowledge. The majority of responders are properly informed about dengue [11]. This supports the results of current cross-sectional study, 86.11% of Karachi natives know how to avoid acquiring dengue fever. According to a study by Ruth Priya and Smitha, people who have diabetes, hypertension, renal failure, ischemic heart disease, or alcoholism are more likely to develop severe dengue and may benefit from closer observation or more intense care [12]. Our findings described that the liver, which is the organ mainly affected by the disease 39% of respondents in general were unaware of the targeted organ, the majority of respondents (61%) provided an accurate

response. Gupta et al made up the meta-analysis by adding the 20 papers that had a mean fever duration of 5.1 (95% CI: 4.7-5.5) days. Further describe that the individuals with higher fever grades, more severe diseases, and co-occurring bacterial illnesses exhibited longer fever durations [13]. In the current survey, 56.52% of respondents erroneously said that the DF cycle lasted two to seven days. According to estimates, 8.2% of people are not aware of the symptoms and indicators associated with DF, but 11.95% said major symptom of dengue is fever, 52.6% said its joint pain and 34% said major sign is muscle pain. A study by Dhiman et al carried out on some medicinal plant species, i.e., Nyctanthes arbor-tristis L., Firmiana simplex (L.) W. Wight, T. sinensis, and Moringa oleifera Lam., and investigate their metabolic profiles supporting their anti-dengue properties (antilarval or anti-DENV, in the authors' laboratory). In addition, larvicidal activity of N. arbor-tristis, M. oleifera, and T. sinensis have been reported [14]. In present investigation the public (10.4%) indicated the use of drugs to manage DF, including aspirin, diclofenac, naproxen, and mefenamic acid; however, a small percentage of people (24.9%) are aware that DF can be managed by drinking plenty of water. In another study Wong et al

demonstrated acetaminophen and physical cooling techniques can lower fever; aspirin and nonsteroidal anti-inflammatory medications are not advised due to the risk of bleeding and thrombocytopenia. An essential part of outpatient dengue treatment is early and copious oral hydration, which has been linked to a decreased hospitalization rate in children with the disease [15]. Ghali et al stated that, N, N-Diethyl-meta-toluamide (DEET) has been regarded as the "gold standard" for insect repellent application and makes up the majority of repellents available on the market. However, the main points of contention in discussions over the efficacy of DEET insect repellents for shielding kids from arthropod bites are contradictory evidence found in scientific publications and ambiguous information presented in the media [16]. In present cross sectional surveyed, 4.26% stated they would apply oil of lemon eucalyptus (OLE) to children, whereas 24.67% said they will not apply on children and 31% were not aware that OLE was used. Just 29.7% of respondents disagreed with the idea of treating DF with antibiotics. The majority of respondents (53.17%) agreed to treat DF with antibiotics.

CONCLUSION

This cross-sectional study found that 86.11% of Karachi residents are aware of ways to prevent getting dengue fever. According to our research, the majority of respondents (61%) correctly identified the targeted organ, the liver, which is the organ most afflicted by the condition. However, 39% of respondents overall were ignorant of the targeted organ. 56.52% of participants in the current study correctly stated that the DF cycle lasted two to seven days. Estimates show that 10.22% of people are

unaware of the signs and symptoms connected to DF. In the current study, the general public reported having control over the usage of medications to treat DF, such as aspirin, diclofenac, naproxen, and mefenamic acid; yet, only 24.9 percent of respondents knew that drinking lots of water can help manage DF. In the current cross-sectional study, 24.67% of respondents were conscious to use oil of lemon eucalyptus (OLE) in children, whereas 4.26% said they would apply OLE to children. Only 29.7% of respondents were against treating DF with antibiotics, and 20% had no knowledge that they were being used. A large percentage of participants (53.17%) concurred that DF should be treated with antibiotics.

Though the KAP indices looked good more than 55% of the sample had high knowledge, more than 72% had a positive attitude, and almost 58% applied a preventive measure. We expected some more "better" results.

Ethical Approval

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