



Knowledge Regarding Dengue Fever Vector and Its Prevention among Febrile Patients Presenting at Rural Health Center, Jalalpur Bhattian, District Hafizabad.

Zahid Javed¹, Fareeda Nasir Khan¹, Arooj Fatima Naqvi¹, Saima Ayub¹, Faisal Mushtaq^{1*} and Muhammad Umar Farooq¹

¹ Institute of Public Health, University of the Punjab, Lahore

^{1*} faisalskml@gmail.com

Abstract: Background: Dengue fever is arthropod borne contagious disease and is found in more than 100 countries. The increasing prevalence of dengue is the alarming situation for the concerned departments which need timely interventions for the preventions and medical treatments. So, knowledge assessment among the patients could serve as a key aspect for prevention. **Objectives:** The objective of this study is to assess the knowledge about dengue fever vector, its breeding and biting practices and its prevention among febrile patients presenting at RHC Jalalpur Bhattian District Hafizabad. **Methods:** The cross-sectional descriptive study among 211 febrile adult patients was conducted using convenient sampling. The study was conducted at the Rural Health Center, Jalalpur Bhattian District Hafizabad, Pakistan from 1st Nov, 2020 to 30th Nov, 2020. Data was collected through a questionnaire and analyzed by using SPSS version 20.0. Frequencies (%) were calculated for categorical variables. Means were calculated for continuous data. **Results:** While assessing the knowledge of the patients, out of 211 patients, those who knew about self-checking of dengue larvae, bite time of mosquito, benefits of full sleeve dressing, benefits of use of net, mospel, coil, mat and screen of door/windows were 68 (32.2%), 47 (22.3%), 170 (80.6%), 205 (97.2%), 191 (90.05%), 196 (92.9%), 197 (93.4%) and 42 (19.2%), respectively. **Conclusion:** A low level of knowledge was observed regarding various aspect of dengue fever including its mode of spread vector breeding and biting practices.

Keywords: Dengue, Dengue fever, Suspected, Probable.

1. Introduction

Dengue is a disease that normally presents in patients with fever and other signs and symptoms like flu-like illness along with nausea, vomiting, fever and body aches (Simmons et al., 2012). Dengue fever (DF) is among the most extensively spread vector borne disease affecting almost all the major WHO regions, transmitted by bites of the female *Aedes* mosquitoes which is already infected with dengue virus. Among humans, DF is caused by any one of four serotypes of DF virus (DENV₁₋₄) belonging to the Flaviviridae family sub classified into genus Flavivirus. The WHO revised the classification of Dengue cases in 2009 that classified patients with DF as per severity of the disease and into three types like DF without warning signs; dengue with warning signs (persistent vomiting, pain in abdomen, fluid overload state, bleeding from mucosal surfaces, severe weakness, increased liver size, raised hematocrit with fall in platelet counts); and severe dengue viral infection

(dengue with drastic capillary plasma leakage, extensive bleeding, or multi organ dysfunction) (Hadinegoro, 2012).

DF is considered a major public health issue, spread by Arthropods across the globe affecting WHO member states in all major WHO regions in terms of mortality and morbidity and especially in Asia contributing 70% of the burden and India contributing to 34% among the global disease burden. Dengue is now prevalent with extensive distribution in over one hundred countries with majority of cases recorded from World Health Organization's South-East Asia, America and Western Pacific regions (Bhatt et al., 2013).

In the capital of Province of Sindh, Pakistan, the port city of Karachi, during 1994, country's first confirmed dengue case was diagnosed and after that this disease gradually shifted to other towns and cities of the country (Rauf et al., 2017). The first epidemic of DF in Pakistan was reported in 2006 in the city of Karachi (Kularatnam et al., 2019). Dengue is endemic in Lahore, capital of the province of Punjab in 2010, with 16580 confirmed dengue fever cases and 257 deaths due to dengue fever were recorded in Lahore. Around 5000 confirmed dengue fever cases and 60 deaths have been recorded from other areas of the country. The DF is now epidemic among areas of Punjab, Khyber Pakhtunkhwa and Sindh (Jahan, 2011). Another outbreak of DF was confirmed in Swat, part of Khyber Pakhtunkhwa province from 7th August to 25th September year 2013. Total 6,376 confirmed DF cases and 23 deaths have been documented from this district with the common serotypes being DENV-2 & DENV-3 (Khan & Khan, 2015). In the year 2013 in Punjab, 1175 confirmed cases of DF were diagnosed at government owned hospitals in Rawalpindi city, and 255 cases of dengue hemorrhagic fever were recorded among 811 dengue confirmed cases at Holy Family Hospital (HFH) Rawalpindi (Shahid et al., 2017).

Pakistan being a developing country suffers from a variety of conditions which promote the vector spread and there is lack of health education and awareness among masses regarding control of vector multiplication. Dengue has spread in almost most of the country and epidemics are seen frequently in various parts of the country. The main risk factors for spread of *Aedes* Mosquito include unplanned mushroom growth of ill planned colonies in big cities, lack of provision of safe filtered water, improper waste disposal practices, still large number of refugees and lack of proper immunization coverage. These conditions cause widespread breeding of *Aedes* mosquitoes spreading dengue virus infection and as a result every year during favorable conditions epidemics/outbreaks occur affecting widespread areas in various districts of the country, therefore causing raised morbidity and deaths (Masud et al., 2012).

Ongoing serology and epidemiological surveillance and timely interventions are necessary to diagnose the dengue cases ranging from asymptomatic to complicated dengue cases, so that its complications, spread and ultimately deaths can be minimized (Katzelnick et al., 2017).

Knowledge about any diseases in communities plays a pivotal role in inculcating preventive behaviors in people to ensure prevention based upon community participation. Siddique and colleagues (2016) conducted a survey in Karachi to explore knowledge regarding DF and its associated factors and found out the average knowledge to be low and that knowledge, self-efficacy and threat perception were notable predictors for preventive measures adopted for dengue. Among respondents, 517 (85%) knew that it is spread by mosquitos. While only 198 (32.6%) knew that it usually occurs in the rainy season and 419 (68.9%) had answered that dengue mosquitos breed in fresh water. Furthermore, 240 (39.5%), 186 (30.6%) and 173 (28.5%) of the respondents admitted that water standing in flower pots/vases, used tires and used/spare boxes respectively, are sites for mosquito breeding. They reported that 344 (56.6%) of the respondents agreed that uncovered water utensils should be cleaned on a daily basis and almost all the respondents, 586 (96.4%), acknowledged that stored water at home should be covered. Regarding spread of dengue fever, 353 (58.1%) thought that it is a contagious infection which can be transmitted from one person to another. The rate of adequate dengue knowledge within the community was only 32.4% (Siddiqui et al., 2016).

In a study by, Syed and coworkers (2010), concluded a low level of knowledge in low socio-economic stratum during her survey in Karachi and observed that it increased with increasing socioeconomic status and was associated with preventive practices (Syed et al., 2010).

Another study by Ramzan and colleagues (2015) in Wah Cantt, Punjab observed that half of the study participants had adequate knowledge about DF and unexpectedly knowledge had no association with education of the participant (Ramzan et al., 2015). A study from Nepal report a very low level of knowledge that is 12% regarding DF (Dhimal et al., 2014).

Objectives: The objectives of this study were to assess knowledge about DF vector, its breeding and biting practices and its prevention among febrile patients presenting at RHC Jalalpur Bhattian District Hafizabad.

2. Materials and Methods

It was a cross-sectional descriptive study in which 211 febrile adult patients using following formula using proportion (p) of dengue knowledge as 50% and margin of error (d) as 7% were included.

$$\text{Sample size} = \frac{Z_{1-\alpha/2}^2 P(1-P)}{d^2}$$

Convenient sampling method was used. The study was conducted at the Rural Health Center, Jalalpur Bhattian District Hafizabad, Pakistan from 1-11-2020 to 30-11-2020. Participants were asked about socioeconomic data as well as questions for exploring their knowledge about dengue fever vector, its breeding time, biting practices and how to prevent dengue. Data was entered, cleaned and analyzed by using the SPSS (Statistical Package for Social Sciences) version 20.0. Frequency tables were generated for the variables of socio-demographic characteristics and diagnosis of dengue.

Ethical Considerations: Permission to conduct the study was obtained from the concerned vide letter no. 46/IPH dated 03/03/2022. The consent was taken before interviewing the respondents and before drawing the blood sample. Aseptic technique was utilized for blood sample. First aid facility was available to handle any emergency. Confidentiality was maintained by securing the information by using the codification. Data was secured by using passwords.

3. Results

While assessing the knowledge of the 211 participants, those who knew about self-checking of dengue larvae, bite time of mosquito, benefits of full sleeve dressing, benefits of use of net, mospel, coil, mat and screen of door/windows were 68 (32.2%), 47 (22.3%), 170 (80.6%), 205 (97.2%), 191 (90.05%), 196 (92.9%), 197 (93.4%) and 42 (19.2%), respectively. The one patient who did not responded was a foreigner (Iranian). (Table 1) (Table 2) Regarding the visits of the dengue surveillance team, 58 (27.5%) patients told that the dengue surveillance teams have visited their homes and 49 (23.2%) were satisfied with the performance of the team. (Table 3)

Table 1: Knowledge of patients about dengue mosquito and prevention (n = 211)

	Yes		No	
	Freq.	%	Freq.	%
Know about dengue mosquito sites	68	32.2	142	67.3
Know about dengue mosquito bite time	47	22.3	163	77.3
Know about benefits of full sleeve dressings	170	80.6	40	19.0

Table-2: Awareness about mosquito bite prevention at night time (n = 211)

	Yes		No	
	Freq.	%	Freq.	%
Use of net	206	97.2	5	2.4
Use of mospel	191	90.5	19	9.0
Use of coil	196	92.9	14	6.6
Use of mat	197	93.4	13	6.2
Net Doors / Windows	42	19.9	168	79.6

Table-3: Awareness about dengue prevention imported by visiting dengue surveillance team (n =211)

	Yes	No

	Freq.	%	Freq.	%
Favor for team	51	24.2	5	2.4
Satisfaction about performances of team	49	23.2	7	3.3
Literature	9	4.3	47	22.3
Larva picture	9	4.3	47	22.3
Site of larva	40	19.0	16	7.6
Regular checking for larva	32	15.2	24	11.4

4. Discussion

Dengue is a fatal and viral disease which disseminates through a virus. Hundreds of lives and millions of rupees lost through this disease. The risk of epidemics in Pakistan is very high due to rapid growth of population, rapid settlement of the people from rural areas to the cities in search of better earnings, inadequate infrastructure, poor medical and emergency services in rural areas, improper water storage system, substandard sanitation system, poor socio-economic condition, bad habitual attitude, unhygienic environment and much increase in volume of different types of waste like plastic containers, disposable utensils, shoppers etc. which provide suitable and favorable atmosphere for the growth of mosquito and their larvae. These are some important causes of spread of dengue vector in villages and cities. Literacy rate is also low in Pakistan. Per capita income is very low. All these factors are responsible for the growth and spread of DF in Pakistan.

As dengue has become an endemic disease in Punjab its pertinent that masses have adequate knowledge about the disease, its spread and prevention so that they have awareness, motivation and sense of responsibility to take preventive measures.

We observed low knowledge of the patient about the behavior of dengue mosquito. The behavior of the dengue related mosquitoes included the sites of dengue mosquito/ larva and mosquito bite time. This is consistent with findings of Siddique and colleagues (2016) who also reported comparable level of knowledge in Karachi (Siddique et al, 2016). Though this study was conducted in Jalalpur Bhattian which is a small town and far below in terms of overall literacy rate and development from a big metropolitan city like Karachi yet results are comparable. Many patients told that they knew about it by their school going children which is a good point of school health education and integration. Madeha Syed has also observed similar rate of adequate knowledge in Karachi (Syed et al, 2010), which again is very surprising as residents of major cities are expected to be more knowledgeable about diseases which are prevalent, is society and shows success of health education campaigns run through print, mass and social media.

While Mussarat Ramzan during her survey in Wah cant, Punjab reported much higher proportion of participants having adequate knowledge about DF (Ramzan et al., 2015). An interesting finding from her report was no association between literacy of the participant and his knowledge about DF. This finding reflects the importance of good health education strategy of government that it delivers message to masses and they take it without any relationship to their literacy level (Ramzan et al., 2015).

Nepal researchers also observed very low levels of adequate knowledge regarding DF which are even below our finding, showing the importance for health education in their country (Dhimal et al., 2014). It is evident that knowledge of population in small city of Punjab like Hafizabad regarding DF is not sufficient. Robust and consistent health education strategy is required which can comprehensively reach at grass root level and impart knowledge and inculcate responsible behaviors needed for dengue prevention as community participation is of paramount importance in prevention of any public health calamity.

The limitations of the study were time constraint, smaller sample size; hospital setting and also generalizability of the results might be compromised.

5. Conclusions

A low level of knowledge was observed regarding various aspects of DF including its mode of spread, vector breeding as well as biting practices. Hence, more robust and comprehensive health education strategies are required to ensure knowledge-based community participation for dengue fever prevention.

Funding: None

Acknowledgments: Rural Health Centre, Jalalpur Bhattian District Hafizabad, Pakistan

Conflicts of Interest: None

Reference

- Bhatt, S., Gething, P. W., Brady, O. J., Messina, J. P., Farlow, A. W., Moyes, C. L., Drake, J. M., Brownstein, J. S., Hoen, A. G. & Sankoh, O. 2013. The global distribution and burden of dengue. *Nature*, 496, 504-507.
- Dhimal, M., Aryal, K. K., Dhimal, M. L., Gautam, I., Singh, S. P., Bhusal, C. L. & Kuch, U. 2014. Knowledge, attitude and practice regarding dengue fever among the healthy population of highland and lowland communities in central Nepal. *Plos one*, 9, e102028.
- Hadinegoro, S. R. S. 2012. The revised WHO dengue case classification: does the system need to be modified? *Paediatrics and international child health*, 32, 33-38.
- Jahan, F. 2011. Dengue fever (DF) in Pakistan. *Asia pacific family medicine*, 10, 1-4.
- Katzelnick, L. C., Coloma, J. & Harris, E. 2017. Dengue: knowledge gaps, unmet needs, and research priorities. *The Lancet Infectious Diseases*, 17, e88-e100.
- Khan, J. & Khan, A. 2015. Incidence of dengue in 2013: dengue outbreak in District Swat, Khyber Pakhtunkhwa, Pakistan. *Inter J of Fauna and Biolo Stud*, 2, 1-7.
- Kularatnam, G. A. M., Jsainge, E., Gunasena, S., Samaranayake, D., Senanayake, M. P. & Wickramasinghe, V. P. 2019. Evaluation of biochemical and haematological changes in dengue fever and dengue hemorrhagic fever in Sri Lankan children: a prospective follow up study. *BMC pediatrics*, 19, 1-9.
- Masud, F., Butt, T. & Ali M. 2012. Dengue Expert Advisory Group (DEAG), Dengue GCP guidelines 2012. Lahore: DEAG.
- Ramzan, M., Ansar, A. & Nadeem, S. 2015. Dengue Epidemics: Knowledge Perhaps Is The Only Key To Success. *Journal of Ayub Medical College, Abbottabad: JAMC*, 27, 402-406.
- Rauf, A., Kazmi, N. H. S., Zaman, H., Gillani, S., Shah, T., Malik, F. & Ismaeel, S. 2017. Pattern of presentation among adults hospitalized with Dengue disease. *Journal of Ayub Medical College, Abbottabad: JAMC*, 29, 432-435.
- Shahid, M., Amin, I., Afzal, S., Fatima, Z., Zahid, S., Ashraf, U. & Idrees, M. 2017. Prevalence and molecular detection of dengue virus in 2013 outbreak in KPK and Punjab, Pakistan. *Pakistan Journal of Zoology*, 49.
- Siddiqui, T. R., Ghazal, S., Bibi, S., Ahmed, W. & Sajjad, S. F. 2016. Use of the health belief model for the assessment of public knowledge and household preventive practices in Karachi, Pakistan, a dengue-endemic city. *PLoS neglected tropical diseases*, 10, e0005129.
- Simmons, C. P., Farrar, J. J., Van Vinh Chau, N. & Wills, B. 2012. Dengue. *New England Journal of Medicine*, 366, 1423-1432.
- Syed, M., Saleem, T., Syeda, U.-R., Habib, M., Zahid, R., Bashir, A., Rabbani, M., Khaloid, M., Iqbal, A. & Rao, E. Z. 2010. Knowledge, attitudes and practices regarding dengue fever among adults of high and low socioeconomic groups. *Journal of the Pakistan Medical Association*, 60, 243.