

Review article

Incidence of dengue fever and risk of its transmission to the Afghan travelers to tropical regions: A discussion paper

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Key words: Dengue Fever, Afghanistan, Afghan Travelers, Communicable Disease, Public Health.

Abstract

This review article discusses the transmission or importation of dengue fever to Afghanistan by travelers from tropical countries. The dengue fever, transmit by aedes mosquito (Asian tiger) to humans. The Asian tiger is found in tropical parts of world especially in east parts of Asia like Malaysia, India and Pakistan. The disease spreads or transmit through a bite by mosquito and from infected person to mosquito and thus to others. Millions of Afghans are travelling around the globe each year, especially to Pakistan, India and Iran, where the dengue virus found. Living in tropical areas, climate changes, global warming and urbanizations leads to the transmission and migration of the disease from one person to another. The aim of this paper was to know the mood of transmission, existence of dengue fever in Afghanistan and its control measures. Therefore, travelers must be advised, prior to travelling to dengue prone areas. Mass media campaigns, awareness workshops and control measure must be adapted by the Ministry of Public Health about dengue fever.

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Introduction

Importation of dengue fever (DF) poses a threat to universal health agenda [1]. During the past 50 years the prevalence of DF has increased up to thirty folds. It is estimated that in more than 100 endemic countries approximately 50 to 100 million new cases will emerged [23].

In the tropical regions of southern and Southeast Asia, the Western Pacific regions, Central and South America, the Caribbean, and Africa mostly the DF is endemic, coupled with climate change and urbanization [2, 3]. Millions of Afghans are travelling to dengue endemic countries, especially Pakistan, India and Iran and other southern and Southeast Asia countries each year for different purposes such as treatment, education, business and tourism etc.

This review article looks at how the DF transmits or migrates from one place to another or from one infected person to another. The DF is spread throughout 100 countries and more than two billion people are at risk,

especially in tropical areas [4]. DF has four different serotypes; alike DENV-1, DENV-2, DENV-3 and DENV-4 [5], typically none of them is severe at initial stage of infection but it could be severe later on, due to several factors such as multiple organs impairments, plasma leakage and dengue hemorrhagic complications, extreme external and internal bleeding [6].

Spread or transmission of DF

DF is the important arthropod-borne viral diseases and transmitted by Aedes mosquito (*Aedes aegypti*) [7]. When Aedes mosquito bites an infected person (who has dengue virus in his or her blood), the mosquito becomes infected. When an infected mosquito bites a healthy person then he or she becomes infected. It is to bear in mind the dengue cannot be spread directly from one person to another, and mosquitoes are necessary for transmission of the dengue virus [24]. Research suggests that, asymptomatic people can be infectious to mosquitoes [8].

The transmission of this viral disease is vertical, especially from mother to child during pregnancy or after birth [9]. Following the decease of the infant, dengue virus type 2 was collected from the infant's blood, and IgM was found in the mother's blood [10].

Discussion

The migration of students, businessmen, and travelling of patients for treatment and tourists is the main reason for the importation of DF [11]. On the other hand the outbreak, prevalence, climate change, global warming, urbanization are the predisposing factors to DF [12]. According to the reports, annually 2 million people affects by DF, and the number of people has increased by 30 times over the past 50 years [13].

DF prevalence in Pakistan

The first case of DF was reported from Pakistan in 1982. Since then, multiple major dengue outbreaks have been noted in Pakistan. Maximum number of dengue related deaths in Pakistan were noted in the year 2011. In 2015 in one of the Pakistan's city, Rawalpindi, 3917 dengue patients were diagnosed and again in 2019, 11941 patients were diagnosed [14].

Since 1992 several DF outbreaks occurred and becoming most rapidly spreading mosquito born viral disease now a day. In addition, research reported that in two districts (Buner & Shangla) of Khyber Pkhtunkhwa (North and West) Pakistan, 320 positive cases of DF were recorded from July to November, 2013.

DF prevalence in India

Dengue virus or breakbone fever was first occurred in Calcutta, India in 1945 [15]. The first DF endemic was reported in 1963-64 in India, when dengue gradually spread from the country's southern areas to its northern regions and increasingly to the entire country by 1968 [16].

During 1967, eight dengue events were recorded in Delhi. The report of the incidence of DF was also reported in 2006, and four years later, in 2010, a large number of populations suffered from DF. During 2016, Delhi reported a total of 4431 dengue cases, out of which 2857 (58.24%) cases were reported from Delhi and 1844 (41.76%) cases were reported from outside Delhi [17].

DF prevalence in Iran

The DF case recorded in Iran was imported and it was traced in 58-year-old after her trip to Southeast Asia (Malaysia) [18].

Import of DF to Afghanistan

The hyperendemicity and transmission of DF has been recognized in several urban areas of tropical countries where fast development has supported vector spread. Increasing international travel, ineffective DF control measures, lack of access to vaccine have likely added to the geographic dispersion of dengue [18]. As the incidence and outbreak of the disease is widespread in neighboring countries and millions of Afghans are travelling to Pakistan, India, Iran and other tropical countries for difference reasons such as education, treatment, tourism and business. The changes in environment must be taken into consideration, especially the areas adjacent to Pakistan borders. This disease may be present in Afghan provinces that are bordered by Pakistan, but due to the lack of awareness or information about DF mostly it is misdiagnosed with other similar diseases.

In addition the climatic change and local conditions like global warming, lack of access to clean drinking water, inappropriate hygienic and sanitary condition, deficiency in rain water harvesting system (RWHS), lack of awareness about dengue and their transmission paved the way becomes epidemic [19]. Migration of infected people from one place to another is also an important reason for epidemic [20].

DF in Afghanistan

Amid to increasing numbers of DF cases in Pakistan and India, healthcare providers in Afghanistan boosted the surveillance for the DF. At this end, the Central Public Health Laboratory (CPHL) in Kabul began to expand the investigation for possible cases of the DF. As a result, 14 out of 40 samples tested was DF positive. Of the 14 confirmed cases of DF, seven were most probably autochthonous as the persons had no travel history to dengue endemic regions. One of the seven autochthonous cases died due to hemorrhagic fever and the remaining six other cases had travel history. Among 14 cases, 12 (86%) were males, between the age of 21 to 55 years old [25].

Implications

Afghanistan is experiencing humanitarian emergency along with ongoing conflicts, frequent natural disasters, novel COVID-19 and waves of internal displacement of people and mass casualty incidents. Based on "2018 Afghanistan Health Survey" approximately 90% of the population has access to primary health care (PHC) facilities with a cumulative 2 hours distance and in addition, the country has limited capacity to prevent and control dengue outbreaks [26]. Therefore, it is of paramount of importance to control the vector in order to lessen the burden on already fragile health system.

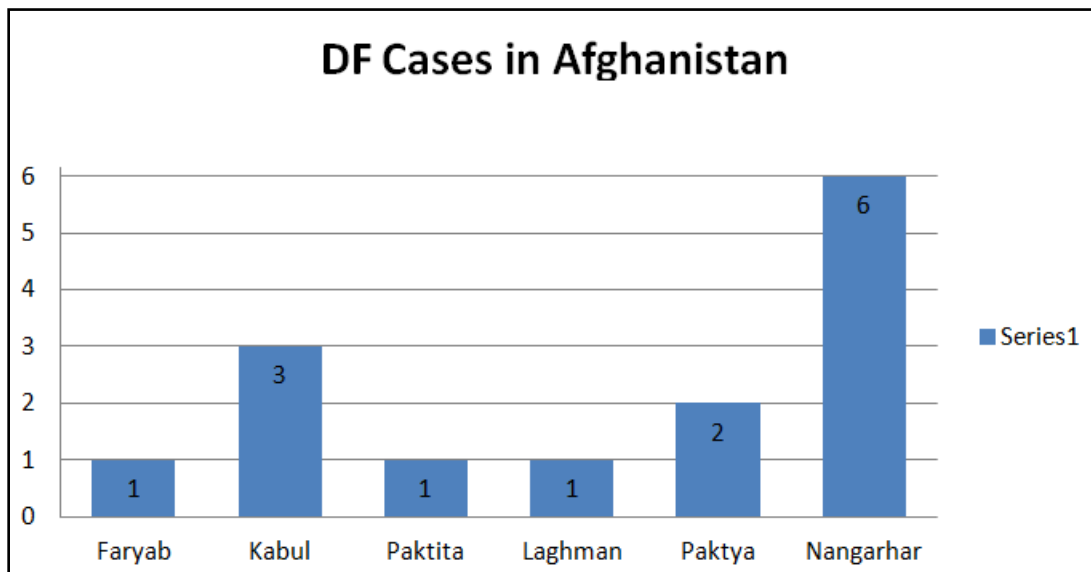


Figure 1. Shows that 14 cases were reported from six provinces: Faryab (1 case), Kabul (3 cases), and four provinces bordering Pakistan, where a large outbreak of DF is ongoing: Paktita (1 case); Laghman (1 case); Paktya (2 cases); Nangarhar (6 cases) [25].

The current cases of autochthonous DF virus in the six affected provinces pose a risk to other areas in Afghanistan where the virus has not previously been recorded. Increased displacement of people due to armed conflicts, natural disasters and movements during the rainy season cause an increased threat of spreading or escalating the existing DF outbreaks [25].

Recommendations

According to old proverb “Prevention is better than cure”, therefore, the healthcare providers in Afghanistan must take preventative measures and effective approaches reducing the risk of dengue infection, as there is no specific treatment for the disease. The main methods of controlling or preventing the transmission of dengue virus aim to combat the mosquito vector through the following actions:

1. Focus on Public Awareness: The government, private sector and other healthcare providers and activists are required to work in coordination to boost up the community awareness, community participation in workshops, and mobilization for sustained vector control;
2. Control Measures: Healthcare providers and Municipalities in Afghanistan, especially infectious disease department should work to prevent mosquitoes from accessing egg-laying habitats by environmental management and modification (source reduction and chemical control measures);
3. Waste Management: Proper and effective solid waste disposal and removing man-made habitats;
4. Access to Clean Drinking Water: Government is required to implement Sustainable Development Goal (SDG) targets 6.1 and 6.2 [21]. The aim of these

targets is to achieve universal and equitable access to safely managed drinking water, sanitation and hygiene and end open defecation by 2030. In addition, the households are required to cover, empty, and clean the domestic water storage containers on regular basis;

5. Vector Control: Dengue prone areas must be sprayed using insecticides during outbreaks as an emergency vector-control measure. In addition, apply effective insecticides to water storage in outdoor containers that cannot be cleaned;
6. Using personal protection products: For personal and household protection purposes, it is required to install window screens and mosquito nets and wear long-sleeved clothing and use insecticide treated materials [22];
7. Monitoring and Vigilance: Surveillance and monitoring of vectors by surveillance department, providing necessary tools and employing effective control measures;
8. Clinical Management and Treatment: The mortality rate is significantly decrease by careful clinical detection and management. Therefore the clinicians and nurses should be properly trained in clinical management of DF.

Conclusion

The DF is a common and universal disease and is more common in countries with a warm and humid climate. The bite of an insect that has previously been stinging an infected person is enough to spread the disease to another person. Therefore, Afghans who are travelling abroad are required to have enough information about DF and how to prevent themselves. This way, the travelers can prevent themselves and control the import of this fatal disease.

Public health authorities are required to launch mass media campaigns, awareness workshops and control measure in regards to DF.

References

- Gwee S, Pang VJ: Global Sources of Dengue Importation: A Systematic Review. In: 2020: 19th International Congress on Infectious Diseases; 2020.
- Hales S, De Wet N, Maingonald J, Woodward A: Potential effect of population and climate changes on global distribution of dengue fever: an empirical model. *The Lancet* 2002; 360(9336):830-834.
- Åström C, Rocklöv J, Hales S, Béguin A, Louis V, Sauerborn R: Potential distribution of dengue fever under scenarios of climate change and economic development. *Ecohealth* 2012; 9(4):448-454.
- Souza Ljd, Martins ALdO, Paravidini PCL, Nogueira RMR, Gicovate Neto C, Bastos DA, Siqueira EWdS, Carneiro RdC: Hemorrhagic encephalopathy in dengue shock syndrome: a case report. *Brazilian Journal of Infectious Diseases* 2005; 9(3):257-261.
- Dhanoa A, Hassan SS, Ngim CF, Lau CF, Chan TS, Adnan NAA, Eng WWH, Gan HM, Rajasekaram G: Impact of dengue virus (DENV) co-infection on clinical manifestations, disease severity and laboratory parameters. *BMC infectious diseases* 2016; 16(1):406.
- Yacoub S, Wills B: Dengue: an update for clinicians working in non-endemic areas. *Clinical Medicine* 2015; 15(1):82.
- Guzman MG, Halstead SB, Artsob H, Buchy P, Farrar J, Gubler DJ, Hunsperger E, Kroeger A, Margolis HS, Martínez E: Dengue: a continuing global threat. *Nature reviews microbiology* 2010; 8(12):S7-S16.
- Duong V, Lambrechts L, Paul RE, Ly S, Lay RS, Long KC, Huy R, Tarantola A, Scott TW, Sakuntabhai A: Asymptomatic humans transmit dengue virus to mosquitoes. *Proceedings of the National Academy of Sciences* 2015; 112(47):14688-14693.
- Singh N, Sharma K, Dadhwal V, Mittal S, Selvi A: A successful management of dengue fever in pregnancy: report of two cases. *Indian journal of medical microbiology* 2008; 26(4):377.
- Chye JK, Lim CT, Ng KB, Lim JM, George R, Lam SK: Vertical transmission of dengue. *Clinical Infectious Diseases* 1997; 25(6):1374-1377.
- Yue Y, Liu X, Xu M, Ren D, Liu Q: Epidemiological dynamics of dengue fever in mainland China, 2014–2018. *International Journal of Infectious Diseases* 2019; 86:82-93.
- Bouزيد M, Colón-González FJ, Lung T, Lake IR, Hunter PR: Climate change and the emergence of vector-borne diseases in Europe: case study of dengue fever. *BMC public health* 2014; 14(1):781.
- Ebi KL, Nealon J: Dengue in a changing climate. *Environmental research* 2016; 151:115-123.
- Khurram M, Khan MM: DENGUE EPIDEMIC CLINICAL MANAGEMENT.
- Haritha P, Brundha M: Awareness of dengue fever among the parents of children coming to the dental outpatient department—A questionnaire study. *International Journal of Clinicopathological Correlation* 2019; 3(2):60.
- Gupta N, Srivastava S, Jain A, Chaturvedi U: Dengue in India. *The Indian journal of medical research* 2012; 136(3):373-390.
- Rajvanshi H, Narayanan P, Hossain S, Dhariwal A: Trend-Analysis of Dengue Cases and its relation to Vector Density in Selected Areas of Delhi State. *Journal of Communicable Diseases* 2019; 51(2):54-58.
- Mardani M, Abbasi F, Aghahasani M, Ghavam B: First Iranian imported case of dengue. *International journal of preventive medicine* 2013; 4(9):1075.
- Shahid S: Probable impacts of climate change on public health in Bangladesh. *Asia Pacific Journal of Public Health* 2010; 22(3):310-319.
- Kumar S, Singh M, Chakraborty A: Climatic imbalance and their effect on prevalence of dengue fever in India. *International Journal of Current Microbiology and Applied Sciences* 2015; 4(11):185-191.
- WHO, Organization WH, Unicef: Progress on drinking water, sanitation and hygiene: 2017 update and SDG baselines. World Health Organization 2017.
- Frances SP: Strategies for using personal protection products. *Insect repellents handbook*, 2nd ed CRC Press, Boca Raton, FL 2014:317-330.
- <https://www.who.int/denguecontrol/resources/9789241504034/en/>
- <https://www.nature.com/scitable/topicpage/dengue-transmission-22399758/>
- <https://www.who.int/csr/don/13-december-2019-dengue-afghanistan/en/>
- <https://www.kit.nl/wp-content/uploads/2019/07/AHS-2018-report-FINAL-15-4-2019.pdf>