Original Article

Dengue Outbreaks

Dengue Virus Outbreaks at a Tertiary Care Centre in Lahore

Aalia Hameed[1], Mateen Izhar[1], Muhammad Humayun[2] and Khalid Mahmood[1]

ABSTRACT

Objective: To assess the incidence of dengue fever by anti-dengue IgM and IgG.
Study Design: Cross sectional study.
Place and Duration: This study was conducted at the Shaikh Zayed Hospital, Lahore from 5th October to 31st December 2010.
Materials and Methods: A total of 2681 persons presenting with high grade fever were brought to Sheikh Zayed Hospital. Complete blood count and anti-IgM and IgG tests were done on those patients.
Results: A total of 2681 persons presenting with high grade fever, males were 1687 and females were 994 suspected of dengue infection with ages raging from 1-85 years. Out of 2681 patients, 1075 were diagnosed as positive for infection. Primary dengue infection (IgM +ve) was 52.83%, out of which males were 62.14% and females were 37.86%, male to female ratio was 1.6:1. Secondary dengue infection (IgG +ve) was 8.74%, out of which males were 70.21%, females 29.78%, male to female ratio was 2.36:1. Co-infection (IgM+IgG +ve) were 37.48%, males were 68% and females 32% and male to female ratio was 2.2:1. Dengue infection was mostly seen in adult patients.
Conclusion: Mostly adults are affected, males twice as compared to females. At present the only method of controlling dengue fever and dengue haemorrhage fever is to combat vector e.g. mosquito by creating awareness through print and electronic media.
Key Words: Dengue virus, Primary and secondary dengue infection

Citation of article: Hameed A, Izhar M, Humayun M, Mahmood K. Dengue Virus Outbreaks at a Tertiary Care Centre in Lahore. Med Forum 2017;28(1):48-50.

INTRODUCTION

Dengue fever and dengue hemorrhagic fever is a common public health concern in many countries all over the world.[1] According to WHO, nearly 2.5-3 million people are at risk of infection with this unique virus, which is nearly two fifth of the world population.[2] Dengue is a critical mosquito borne viral infection. It occurred sporadically till the 19th century. Recent year have seen epidemics of this arthropod born viral disease and currently it is endemic in 112 countries across the world.[3-4]

Dengue virus transmission has increased dramatically in the past two decades, making this virus one of the most significant mosquito borne pathogen.[5] There has been re-emergence of this disease in many tropical countries, including India, Bangladesh and Pakistan.[6] According to WHO, more than 100 million new cases of dengue fever occur world-wide including dengue hemorrhagic fever (500,000) cases and dengue shock syndrome with 2.5% mortality.[7-8]

1. Department of Microbiology, Shaikh Zayed Postgraduate Medical Institute, Lahore.
2. Department of Medical Entomology & Parasitology, Institute of Public Health, Lahore.

Correspondence: Dr. Aalia Hameed, Associate Professor of Microbiology, Shaikh Zayed Postgraduate Medical Institute, Lahore.
Contact No: 0345-4194017
Email: dr.aaliahameed@outlook.com

Received: November 1, 2016; Accepted: December 10, 2016

Dengue fever epidemic was first reported during 1779 in Asia, Africa, North America and its pan-endemic occurred after 2nd World War due to rapid urbanisation in South-East Asia, leading to an increase in transmission and hyperendemecity.[9-11] Global distribution of dengue fever is now compairable to Malaria and according to WHO estimates, 100 million new cases of dengue fever occur world-wide each year including a potentially lethal form of disease such as dengue hemorrhagic fever.[7,8,12] WHO classifies dengue as a major international public health concern because of the expanding geographic distribution of both the virus and its vector, increasing frequency of epidemics, co-circulation of multiple virus serotypes and occurrence of DHF and DSS in the developing areas of the world. Majority of dengue fever cases behave as self-limiting febrile illness, however, severe infection lead to potentially fatal dengue hemorrhagic fever and more severe Dengue Shock Syndrome.[13] Dengue is endemic in South-East Asia and in the Indian subcontinent and is also seen in Africa.[14] Some Asian countries e. G. Philippines, Thailand, Indonesia, Malaysia, India, Myanmar etc are dealing with this problem for the last few decades.[15]

Dengue virus constitutes the most common flavi virus infection in the world. The case fatlity rate of DHF and DSS is arround 5%.[16] Dengue is transmitted by the bite of mosquito vector Aedes Aegypti and sometime by Aedes albopictus specially in South-East Asia. Dengue virus is an arbo virus and has four serological forms (1, 2, 3, 4). Each serotype provides life long immunity and short term cross immunity. The hetro logos antibodies

from previous infection act as a non-neutralizing antibodies in any subsequent infection with a different serotype of virus, forming complexes with new infecting serotype. These complexes can cause the antibody dependent enhancement of heterotypic secondary dengue infection. The enhancement of severe disease upon secondary infection makes dengue almost unique among infectious pathogens.[17]

In Pakistan, dengue fever has been around for the past 60 years. The 1st major outbreak was in 1950 and then in 1994-95.[18] Dengue fever was also noticed in 1982 but the first documented report was in 1985.[19] Whereby dengue type 2 virus was isolated in sero-epidemiological study of encephalitis. Another outbreak was seen in 2005[20] and then in 2006.[21] In Punjab 21212 cases of dengue fever were reported in 2010-2011 and mortality was 1-5%.[22] The incubation period of dengue fever ranges between 3-15 days[10], clinical features are sudden onset of high-grade fever, chills, headache, retrobulbular pain, musculoskletal pain, relative bradycardia, lymphadonapathy prostration and depression vomiting and bleeding diathasis. WHO criteria for dengue fever is fever, headache, retro bulbular pain, body aches, vomiting and rash.

MATERIALS AND METHODS

This cross-sectional study was carried out at Shaikh Zayed Hospital, Lahore, from 5th October to 31st December 2010. A total 2681 persons presenting with high grade fever were brought to Sheikh Zayed Hospital. Complete blood count and anti-IgM and IgG tests were done on the patients. Data was analysed through SPSS-16.

RESULTS

A total of 2861 suspected cases of dengue fever patients were brought to Shaikh Zayed Hospital (male 62.92% and females 37.98%) age ranges from 1-85 years. In this study a total of 1075 patients (40.09%) were exposed to the dengue virus and confirmed by dengue specific antibodies detection test. Dengue IgM positive cases (52.35%) seen in this study, are more in age group 21-40 years while IgG positive cases were 8.74%, in 50-60 years of age. Both IgM and IgG positive (co-infection) was (37.48%) seen predominantly in males with age ranging from 41-69 years. Total cases turnout positive for dengue virus infection were 1075 (40.09%) out of which males were (63.06%) and females were (36.93%). Age ranges from 1-85 years. Highest number of patients were in 20-40 years of age (42%). Fever was the most common symptom (100%), Other symptoms were headache (90%), vomiting (56%), body aches (40%), abdominal pain (20%), and rash was in 10% of the patients. Bleeding manifestation were seen in two patients in the form of gum bleeding. Primary dengue infection was 52.83%, out of which males were 62.14% and females were 37.86%, male to female ratio was 1.6:1. Secondary dengue infection was 8.74%, out of which males were 70.21%, females 29.78%, male to female ratio was 2.36:1. Co-infection was 37.48% (both IgG + IgM^{+}), males were 68% and females 32% and male to female ratio was 2.2:1. Dengue infection was mostly seen in adult patients, twice more in males as compared to females. Almost all patients develop mild to moderate leucopenia and thrombocytopenia.

Table No.1: Gender-wise distribution of the patients (n=2681)

Gender	No.	%age
Male	1687	62.92
Female	994	37.92

Table No.2: Frequency of positive cases among genders (n=1075)

Gender	No.	%age
Male	678	63.06
Female	397	36.94

Table No.3: Distribution of positive cases in acute, chronic and co-infection cases

Gender	No.	%age
IgM +ve	**568**	**52.83**
Male	353	62.14
Female	215	37.85
IgG +ve	**94**	**8.74**
Male	66	70.21
Female	28	29.78
IgG+IgM +ve	**403**	**37.48**
Male	274	67.99
Female	129	32.0

DISCUSSION

Dengue fever is an old disease. Early recognization of clinical signs and symptoms and risk factors for dengue infection are helpful in early diagnosis of DSS is particularly important as patient may die within 12-24 hours, if early appropriate treatment is not administrated. Close monitoring of young children and elderly patients, especially in patient with nosocomal infection may lessen the case fatality. Secondary infection is also most important risk factor for DHF/DSS. Dengue virus is now endemic in Pakistan, circulating throughout the year with a peak incidence in the post-monsoon period.[21] This period of the study was from October to December with the peak level of incidences seen in the month of October. In this study majority of the patients were between 20-40 years of age, with highest number of patients between 28-30 years of age. This is comparable to study conducted in Sindh 2006, Saudi Arabia[17] and also in other studies conducted in Karachi[21] and Lahore. This is contrary to other reports which show that dengue mainly occurs in children less than fifteen years of age. It may represent

that dengue infection is asymptomatic in 80% of children. This illness is more severe and begins more suddenly in adults.

In this study dengue IgM was detected in 52.82% patients which is high as compared to previous studies 48.7%, 44.82% and 26.3%.[21] Second serum sample was not tested in undetected IgM patients because of varies reasons included financial problems, as faced by other researchers.[17] Analysis of the peak dengue cases were in the month of October ranging from October to December. This pattern is consistent with the reports from other endemic countries.

CONCLUSION

Dengue is a mosquito born viral infection which in the recent years has become a major public health problem. It is an acute febrial illness with manifestations ranging from asymptomatic to self limiting illness of short duration to grave bleeding tendencies and shock in rare occasions. The adult males are affected twice more than females. Most of the time patients recover spontaneously but the disease can be fatal especially as a secondary infection. At present the only method of controlling or preventing dengue and dengue hemorrhagic fever is to combat the vector i. e. mosquito, by creating awareness through print and electronic media.

Conflict of Interest: The study has no conflict of interest to declare by any author.

REFERENCES

1. Dengue and Dengue Haemorrhagic fever. In: WHO: Prevention and control of Dengue and Dengue Haemorrhagic fever. WHO/SEARO, Publication No.29, New Delhi, 1999 3-9.
2. Yunus EB, Banu Dilrose, Chakder KR, Ghowdhury MJQ, Bangali AM. Report on the sero-epidemiological study of dengue and dengue haemorrhagic fever. ICDDR,B project, Directorate General of Health Services, Bangladesh, 1998.
3. Pinheiro FP, Corber SJ. Global situation of dengue and dengue haemorrhagic fever and its emergence in the Americas. World Health Stat 1997;50:161-9.
4. World Health Organization Prevention and Control of Dengue and Dengue Haemorrhagic Fever. Comprehensive guidelines. WHO Regional Publication, SEARO No.29, 1999.
5. Rico-Hesse R Dengue virus evolution and virulence models. Clin Infect Dis 2007;44(11): 1462-6.
6. Dash PK, Parida MM, Saxena P, Abhyankar A, Singh CP, Tewari KN, et al, Reemergence of dengue virus type 3 (subtype-III) in India: implications forr increase incidence of DHF and DSS. Virol J 2006;3:55.
7. WHO. Health Situation in the South East Asian Region 1998-2000. WHO Regional Office, South East Asia, New Delhi.
8. McBride WJ, Bielefeldt-Ohmann H. Dengue viral infections: pathogenesis and epidemiology. Microbes Infect 2000;2:1041-50.
9. Barrera R, Delgado N, Jimenez M, Valero S. Eco-epidemiological factors associated with hyper-endemic dengue hemorrhagic fever in Maracay city, Venezuela. Dengue Bull 2002;26: 84-95.
10. Messer WB, Gubler DJ, Harris E, Sivananthan K, deSilva AM. Emergence and global spread of a dengue serotype 3, subtype III virus. Emerg Infect Dis 2003;9:800-9.
11. Gubler DJ. Dengue/dengue haemorrhagic fever: history and current status. Novartis Found Symp 2006;277:3-16.
12. Dengue/DHF. Case fatality rate (5%) of DF/DHF in the South-East Asia Region (1985-2006). Available at: www.searo.who.int/en/Section10/Section332_1102.htm. Access date: July 2007.
13. Gubler DJ. The global emergencies/resurgence of arboviral diseases as public health problems. Arch Med Res 2002;33;330-42.
14. Todd W, Cock-Wood D, Sundar S. Infectious diseases. In: Boon NA. Colledge NR, Walker BR, Hunter JAA, editors. Davidson's Principles and practice of Medicine. 20th ed. Edinburgh: Churchill Livingstone; 2006; 308–9.
15. Aziz MA, Gorlam JR, Gregg MB. "Dacca Fever" an outbreak of dengue fever. Pak J Med Res 1967; 6: 83-9.
16. Halstead SB, O'Rourke EJ. Dengue viruses and mononuclear phagocytes. I. Infection enhancement by non-neutralizing antibody. J Exp Med 1977; 146:201-17.
17. Ayyub M, Khazindar AM, Lubbad EH, Barlas S, Alfi AY, Al-Ukayli S. Characteristics of dengue fever in a large public hospital, Jeddah, Saudi Arabia. J Ayub Med Coll Abbottabad 2006;18(2): 9-13.
18. Ansari JK, Siddi M, Hussain T, Baing I, Tariq WZ. Outbreak of dengue haemorrhagic fever in Karachi. Pak Armed Forces Med J 2001; 51:94-8.
19. Qureshi JA, Notta NJ, Salahuddin N, Zaman V, Khan JA. An epidemic of dengue fever in Karachi: associated clinical manifestations. J Pak Med Assoc 1997; 47: 178-81.
20. Ali N, Nadeem A, Anwar M , Tariq WU, Chotani RA. Dengue fever in malaria endemic areas . J Coll Physicians Surg Pak 2006; 16(5); 340-2.
21. Khan E, Hasan R, Mehraj V. Co-circulation of two genotype of dengue virus in 2006 outbreak of DHF in Karachi, Pakistan. J Clin Virol 2008; 43: 176-9.
22. Wahab MA, Nusrullah AF, Hussain A. Clinical evaluation of dengue in Bangladesh. Binjapur Med Col J 2010; 3: 29-33.