

Disease severity & its Importance in selecting cost effective measures for Dengue management

Sunil Santaji Shivekar^{1,*}, Anand Shankarao Patil², Gopal Rangasamy³

¹Assistant Professor, ³Professor & HOD, Dept. of Microbiology, ²Associate Professor, Dept. of Pathology, Sri Manakula Vinayagar Medical College & Hospital, Pondicherry

***Corresponding Author:**

Email: sunisad@rediffmail.com

Abstract

Background: In recent years Dengue has been referred to as “multimillion disease” because of the high cost in diagnosis and treatment including prolonged hospitalization. India has the world’s highest population suffering from dengue infection with varying degrees of severity resulting in deaths. The high mortality rate in our community has forced doctors to treat dengue injudiciously at times resulting in increase in the cost of treatment and diagnosis. Millions of dollars are spent annually for purchasing diagnostic kits and medicines. The estimation of degree of severity of dengue among the local population may play an important role in selecting the cost effective measure in dengue diagnosis and treatment.

Aims and Objective: In the present study, all the dengue positive cases were examined for degree of severity of dengue infection among the local population and assess the role of platelet transfusion in treatment.

Materials and Methods: The serum samples were tested for dengue IgM antibodies by ELISA method and the platelet count was estimated by using the autoanalyzer.

Results: A total of 82(22.96%) patients were reported positive for dengue-specific IgM antibodies. The analysis of disease risk showed that majority of patients (85.36%) had either low or no risk of developing complications associated with dengue, where as 6% & 8.5% had high and moderate risk to develop dengue complications.

Conclusion: Although dengue infection has been reported with high seropositivity, it is present in milder form which not require hospitalization. In such cases monitoring of platelet count and supportive therapy with analgesic and complete bed rest will be help in management of dengue infection with minimal cost.

Keywords: Dengue severity, management cost and IgM-ELISA.

Access this article online	
Quick Response Code:	Website: www.innovativepublication.com
	DOI: 10.5958/2394-5478.2016.00067.4

Introduction

Dengue fever is an arboviral infection rapidly spreading across various states of our country. The areas formerly reported as non-endemic have become endemic in India.¹ In recent years the cost of diagnosis of dengue fever and management has imposed a great economical burden on the community and the government.²

Dengue fever is usually a self-limited illness. The classical dengue fever does not require hospitalization or platelet transfusion. The periodic monitoring of platelet count estimation with supportive care and analgesics is usually sufficient.³ A recent report by Delhi government has quoted 15000/- to 20000/- rupees expenditure for diagnosis, treatment and management of dengue in private hospital and organization.⁴ A study on estimation of severity of dengue infection in local population may help in selection of cost-effective and

affordable treatment measures. Hence the present study was carried out with the primary aim of estimation of severity of dengue infection and role of platelet in treatment in a rural population of Pondicherry and Tamil Nadu.

Materials and Methods

The present study was carried out in a rural tertiary care hospital of Pondicherry and Tamil Nadu, South India. In this study, all the clinically suspected cases were studied for dengue seropositivity in our region with the primary objective to determine the risk level of dengue associated complications. A total of 357 blood samples were received from the clinically suspected cases of dengue virus infection, from the various outpatient departments, emergency services and in patients of our hospital, over a period of three months. All the samples were screened for IgM dengue specific antibodies by ELISA (Mfd by J. Mitra & Co. Pvt. Ltd). All the samples, positive for anti-dengue IgM were tested for platelet count by autoanalyser (HORIBA) to classify into various risk groups i.e. high, moderate, low and no risk group.⁵ A detailed record of platelet transfusion was also collected from all positive cases to correlate with degree of risk.

Results

During the study period (Aug. – Sept. 2014), a total of 357 serum samples were tested for dengue IgM antibodies. Of these, 82 (22.96%) were positive for dengue-specific IgM antibodies.(Table 1) The infection was equally distributed among male and female patients and the commonly observed age group of the patients was between 16- 60years.(Table 2) Further analysis for the disease risk was assessed on the basis of platelet count and it was found that only 6% and 8.5% of patients showed high and moderate risk for developing dengue associated complications. Remaining 24(29.26%) and 46(56.09%) were noted to be have low risk and no risk for complications associated with dengue. A detail platelet transfusion record of all the dengue positive cases showed that only 10.9% (5 high risk + 4 moderate risk) cases received platelet transfusion, where as 89.1% cases recovered without platelet transfusion. (Table 3)

Table 1: Total number of cases screened

	Male	Female	Total cases
Dengue positive	37	45	82(22.96%)
Dengue Negative	135	140	275(77.04%)
Total cases screened	172	185	357

Table 2: Age wise distribution of dengue positive cases

Age	Dengue positive cases
1-15	10
16-60	68
Above 60	06
Total	82

Table 3: Distribution of positive cases among the various risk groups (82)

Type of Risk	Platelet count/cmm	No. of positive cases (82)	No. of cases received platelet (09)
High risk	< 20,000	05(6.0%)	05 cases
Moderate risk	21-40,000	07(8.5%)	04 cases
Low risk	1 >40,000 but < 100,000	24(29.26%)	Nil
No risk	>100,000	46(56.09%)	Nil

Discussion

In India, dengue has reemerged with significant morbidity and mortality in selected areas.⁶ Till date, dengue has been reported as a small outbreak in and around Pondicherry.^{7,8} This is the first hospital based seroepidemiological study showing high positivity for dengue (22.96%) among the patients clinically suspected of dengue in our hospital. A similar seropositivity was also reported from other places i.e. Delhi, Vellore, Northeastern Region, Chennai and Mumbai.⁹⁻¹³ Platelet is the major target cell for dengue virus and their number in blood is taken as indicator of severity of dengue infection. The present study showed that 94% of dengue positive cases who had no, low or moderate risk and reported with high fever, headache, retro-orbital pain, severe joint and muscle pain, nausea, vomiting and rash were given only supportive therapy like complete bed rest, oral rehydration, pain killer and paracetamol which led to complete recovery with a low cost of less than 1000 rupees. No platelet transfusion was given to these patients. Many hospitals are treating dengue irrationally with unnecessary treatment modalities i.e. Platelet transfusion, antibiotics and prolonged hospital stay, which increases the cost of

dengue management). At present approximately rupees 0-15000/- is required for management of a dengue patient in south India, which is an additional burden on low economic status patients.¹⁴ To prevent such high cost in future education of health professionals to confine dengue treatment to oral analgesics, oral rehydration and discontinue the irrational use of antibiotics and platelet transfusion. The patient's education regarding the self-limiting nature of the illness also will help in reducing dengue management. In addition to this Government should introduce a national level dengue seroepidemiological and management programme similar to RNTCP. All clinically suspected cases of dengue should be referred and get treated only in government centers. The patients with no risk to develop dengue complication should be treated at OPD level with periodical monitoring for sudden fall in platelet count. However a regular surveillance has to be carried out to monitor the emergence of newer serotypes with more severity.

In present study only 6% cases were reported with severe risk showing platelet count of < 20,000/cmm. This severe loss of platelet indicates high risk of developing DHS/DSS in study area. A similar high

severity was also observed in other studies.¹⁵⁻¹⁸ These patients with high risk are eligible to receive platelet transfusion for treatment as per DHS guidelines.¹⁹ All the cases of high risk group were given platelet transfusion. The high risk patients showed severe thrombocytopenia which has to be treated with platelet transfusion to avoid the bleeding. For patients with low, moderate or no risk platelet transfusion is not required.

Conclusion

Dengue infection is present in milder form in the study area which can be managed with the cost effective measures. Unnecessary use of treatment modalities i.e. Platelet transfusion, antibiotics and prolonged hospital stay has to be avoided. Similar seroepidemiological studies all over the country will help to understand the dengue severity among the local population. To reduce the mismanagement in dengue treatment, all the clinically suspected cases of dengue should be treated only at the authorized government centers.

References

- Gupta N, Srivastava S, Jain A & Chaturvedi UC. Dengue in India. *Indian J Med Res* 136, September 2012, pp 373-390.
- Donald S. Shepard, Yara A. Halasa, and the INCLIN Study Group. Economic Disease. Burden of Dengue Illness in India. *Am J Trop Med Hyg*, 2014,91(6):1235-1242.
- Rajapakse S, Rodrigo C, Rajapakse A. Treatment of dengue fever, *Infection and Drug Resistance*. 2012,5:103-112.
- <http://www.thehindu.com/news/national/andhra-pradesh/dengue-treatment-costs-a-bomb/article7748976.ece>.
- Makroo RN, Raina V, Kumar P, and Kanth RK. Role of platelet transfusion in the management of dengue patients in a tertiary care hospital. *Asian J Transfus Sci*, 2007,1(1):4-7.
- Cecilia D. Current status of dengue and chikungunya in India. *WHO South-East Asia J Public Health*, 2014,3(1):22-27.
- Gnanamani G, Prasad KN, Ingalgeri BM & Vinoth kumar PS. An Insight Investigation of Dengue Fever Outbreak in Pondicherry. *International Journal of Scientific and Research Publications*, 2013,3(11):1-4.
- Hoti SL, Soundravally R, Rajendran G, Das LK, Ravi R and Das PK. Dengue and Dengue Haemorrhagic Fever Outbreak in Pondicherry, South India, during 2003-2004: Emergence of DENV-3, *Dengue Bulletin*, 2006,30:42-50.
- Chakravarti A, Matlani M, Kashyap B, Kumar A. Awareness of changing trends in epidemiology of dengue fever is essential for epidemiological surveillance. *Indian Journal of Medical Microbiology*, 2012,30(2):222-6.
- Vijayakumar TS, Chandy S, Sathish N, Abraham M, Abraham P and Sridharan G. Is dengue emerging as a major public health problem, *Indian J Med Res*, 2005,121:100-107.
- Dutta P, Khan SA, Borah J and Mahanta J. Demographic and Clinical Features of Patients with Dengue in Northeastern Region of India: A Retrospective Cross-Sectional Study during 2009-2011, *Journal of Virology & Microbiology*, 2012, (786298):11 pages.
- Bhaskar ME, Moorthy S, Senthil Kumar N, and Arthur P. Dengue haemorrhagic fever among adults – An observational study in Chennai, south India, *Indian J Med Res*, 2010,132(6):738-40.
- Pardeshi A et al. "Retrospective Cross-sectional Study of Dengue Cases in IPD with Reference to Treatment-Monitoring & Outcome in KEM Hospital, Mumbai." *American Journal of Epidemiology and Infectious Disease*, 2014,24:97-100.
- Manoj V. Murhekar, P. Manickam, [...], and V. Kumaraswami. Treatment practices & laboratory investigations during Chikungunya outbreaks in South India. *Indian J Med Res*, 2011,133(5):546-547.
- Jagjit S, Zeya MT, Dhir G, Mann S, Bawa US, Singh P et al. Mortality and Severity Predictors of Dengue Fever. *Sch. J. App. Med. Sci*, 2014,2(6A):1958-1961.
- Rasul CH, Ahasan HA, Rasid AK, Khan MR. Epidemiological factors of dengue hemorrhagic Fever in Bangladesh, *Indian Pediatr*, 2002,39:369-372.
- Tripathi BK, Gupta B, Sinha RS, Prasad S, Sharma DK. Experience in adult population in dengue outbreak in Delhi, *J Assoc Physicians India*, 1998;46:273-276.
- Deen JL. Late presentation and increased mortality in children with dengue haemorrhagic fever, *Trop Doct*, 2000,30:227-228.
- Kumar ND, Tomar V, Singh B, Kela K. Platelet transfusion practice during dengue fever epidemic, *Indian J Pathol Microbiol*, 2000,43:55-60.

How to cite this article: Shivekar SS, Patil AS, Rangasamy G. Disease severity & its Importance in selecting cost effective measures for Dengue management. *Indian J Microbiol Res* 2016;3(3):314-316.