International Journal of Health Sciences and Research
www.ijhsr.org ISSN: 2249-9571

Original Research Article

A Comparative Study of Primary & Secondary Dengue in a Tertiary Care Centre

Sheeba P.M[1], Arun B [2], Prathyusha K[2]

[1]Assistant Professor, [2]Associate Professor,
Department of Microbiology, Government Medical College, Palakkad, India.

Corresponding Author: Sheeba P.M

Received: 29/10/2015 *Revised: 21/11/2015* *Accepted: 24/11/2015*

ABSTRACT

Asia has been the area of highest dengue endemicity with all the dengue serotypes circulating in most countries. This leads to the high prevalence of secondary dengue infections in these areas; India being one among these. As secondary infections lead to complications more frequently than primary, it is essential that we distinguish the two groups of population. In this study a comparison of clinical & laboratory parameters of these groups are attempted. Headache, abdominal pain, vomiting, malena, pleural effusion, ascites, elevated SGOT, elevated haematocrit & thrombocytopenia were found in higher proportions in secondary dengue, which was statistically significant. Complications (DHF: dengue haemorrhagic fever & DSS: dengue shock syndrome) were also more in secondary dengue cases.

Key-words: primary & secondary dengue, clinical & laboratory parameters.

INTRODUCTION

The first major epidemic of dengue in India dates back to 1780, in Madras, from where it spread all over the country. [1] Analysis of dengue epidemics in Kerala illustrates that most of the cases had erupted in the mountainous environs of the Western Ghat ranges, the epicentre being Kottayam. [2] Dengue virus was first isolated in Kerala in 1979, in Trichur. [3] Cyclic dengue epidemics have been occurring since 2001. All the 4 dengue virus serotypes had been detected in Kerala in various epidemics. Complications (DHF: dengue haemorrhagic fever & DSS: dengue shock syndrome) usually accompany secondary dengue virus infections. [4] In this study a comparison of clinical features of primary & secondary dengue is attempted.

MATERIALS & METHODS

The study period extended from 16th August 2008 to 15th August 2009 (1 year). Patients admitted with suspected Dengue fever, satisfying the WHO criteria for dengue, in Department of Paediatrics and Department of Medicine, Government Medical College, Thiruvananthapuram were included in the study. 2126 blood samples were collected. IgM & IgG Dengue ELISA was done with the sera. Patients presenting with fever less than 4 days were chosen for molecular diagnosis (Polymerase Chain Reaction). This was done at Rajiv Gandhi Centre for Biotechnology. IgM and IgG ELISA were also done with the samples. IgM antibody was detected using Capture ELISA, NIV Pune & IgG

using IVD Microwell ELISA. The aim of the study is to compare clinical and laboratory parameters in primary and secondary dengue.

SAMPLE SIZE & SAMPLING

Sample size was fixed according to the formula, $\frac{(1.96)^2 \times PQ}{L^2}$

P = Prevalence

Q = 1- P

L = Precision (20% of P)

The sample size was fixed as 150.

150 primary & 150 secondary were selected randomly. The 300 participants were further evaluated with the help of a proforma.

Statistical Analysis

Data was entered in Microsoft Excel format and analysed using SPSS V13. The data was compiled to form proportions and compared using Chi-square tests.

RESULTS

Of the 2126 samples 685 tested positive for dengue, 269 (39.27%) primary and 416 (60.73%) secondary. The serotype of the virus involved in this outbreak was found to be Dengue virus serotype 1.

The randomly selected 300 samples were studied in detail using proforma & the clinical & lab parameters of primary & secondary dengue were compared.

All the patients presented with fever. 43 (14.2%) of the total had rash. Headache was a common symptom in 57 (37.7%) primary & 74 (48.7%) secondary. 65 (21.5%) of the total study subjects had bodyache, 113 (37.3%) had myalgia and 33 (10.9%) had arthralgia. 18 (5.9%) of the subjects had retroorbital pain. Vomiting was noted in 37 (24.5%) primary & 68 (44.7%) secondary. 26 (17.2%) primary & 39 (25.7%) secondary dengue had abdominal pain.

Bleeding manifestations noted were purpura, petechiae, epistaxis, bleeding gums, ecchymosis, menorrhagia, hematuria, hematemesis, malena etc. One patient had subconjunctival haemorrhage and one with secondary dengue had retinal bleeding.

68 (22.4%) of the total subjects had clinical / sonological evidence of hepatomegaly. This included 29 primary & 39 secondary cases. 33 (10.9%) subjects had splenomegaly; 13 primary & 20 secondary. Myocarditis was documented in 8 (2.6%) cases. 3 (2%) each had pleural effusion & ascites in the primary dengue group. This was 19(12.5%) & 22(14.5%) respectively in the secondary cases. 2 (0.7%) with secondary dengue had pericardial effusion.

TABLE 1: Distribution of different signs, symptoms & laboratory findings in primary & secondary dengue

VARIABLE	PRIMARY	SECONDARY	*p* value
Rash	23	20	0.362
Headache	57	74	0.035
Bodyache	32	33	0.512
Myalgia	56	57	0.518
Arthralgia	16	17	0.508
Retro orbital pain	12	6	0.109
Vomiting	37	68	0.0001
Abdominal pain	26	39	0.049
Malena	7	21	0.006
Hepatomegaly	29	39	0.113
Splenomegaly	13	20	0.139
Myocarditis	2	6	0.143
Pleural effusion	3	19	0.0001
Ascites	3	22	0.0001
Skin/ mucosal bleeding	12	22	0.052
Leucopenia	30	22	0.073
Raised SGOT	96	134	0.006
Elevated haematocrit	29	50	0.010
Thrombocytopenia (<100000)	75	108	0.0001
Complications (DHF/DSS)	9	48	0.0001

DISCUSSION

150 cases each of primary & secondary dengue were studied in detail & a comparison of clinico-laboratory parameters was attempted between the two.

43 (14.2%) had rash with no significant difference between the two study groups. This may be because of the complexion which makes it difficult to interpret rash. Headache was significantly higher in secondary dengue (p value 0.036) (figure 1).

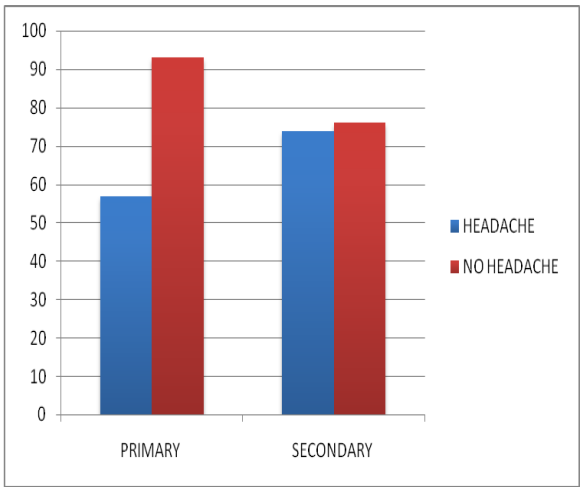

Figure 1: Distribution of headache in primary & secondary dengue

Vomiting was noted in 37 (24.5%) primary & 68 (44.7%) secondary cases which were statistically significant (p value 0.0001). 26 (17.2%) primary & 39 (25.7%) secondary complained of abdominal pain. This was statistically significant (p value 0.049). Similar findings were noted in several studies; the variables seen in higher proportion in secondary dengue cases. [5]

No difference was noted in the two study groups in terms of myalgia, body ache & arthralgia, though some studies have reported a higher incidence of myalgia in secondary dengue. [6] Chitsanu et al reported that myalgia is found in equal proportions in both groups. [5] Bleeding manifestations like petechiae/ecchymosis showed no preponderance in primary/secondary.

Malena was seen in 7 (4.6%) primary & 21 (13.8%) secondary dengue (p value 0.003). Malena was one of the commonest presentations in a study in Delhi. [7] Palmar erythema, facial puffiness, itching & retro orbital pain was seen in equal proportion in the two groups. Retroorbital pain was noted in equal proportions in primary & secondary dengue in other studies as well. [8]

Hepatomegaly & splenomegaly (clinical/sonological) had no association with the dengue type. Other studies have also reported similar findings. [5] Proportion of pleural effusion & ascites was significantly higher in secondary dengue fever (p value 0.0001). A study conducted at Dhaka showed higher proportions of pleural effusion & ascites in secondary dengue. [9]

Thrombocytopenia, platelet counts less than 100,000, was noted more in secondary dengue (p value 0.0001) (figure 2). So many studies document this finding. [10] Haematocrit values > 40 was observed in 29(19.2%) primary & 50(32.89%) secondary cases, which was statistically significant (p value 0.01). Chitsanu et al. showed that haematocrit values are significantly lower in primary dengue fever. [5]

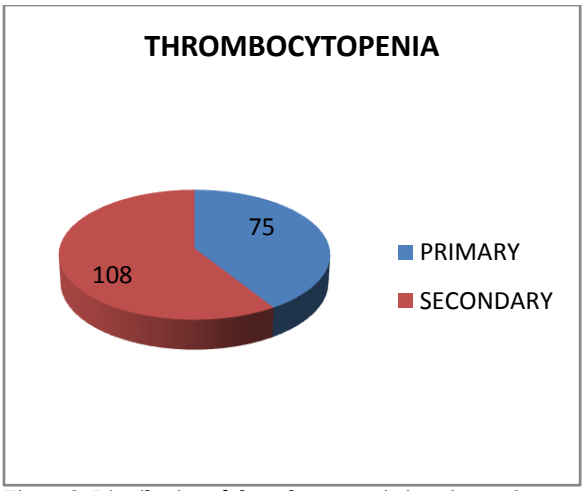

Figure 2: Distribution of thrombocytopenia in primary & secondary dengue

Leucopenia of <3000 was observed in 30(20.5%) primary & 22(14.6%)

secondary. 48(32.9%) primary & 40(26.5%) secondary dengue cases had a total leucocyte count between 3000 & 4500. Though leucopenia is more associated with primary dengue, it was not statistically significant. Significant leucopenia was a feature of primary dengue in one study. [5]

Elevated levels of SGOT were noted more in secondary dengue, which was statistically significant (p value 0.006). SGOT values have been shown to be elevated in dengue fever, independent of SGPT values. [11, 12] No significant association was documented between dengue types & total protein/albumin.

9 cases of primary dengue had DHF/DSS, which included 3 adults. Complications in adults following primary dengue have been reported earlier. [13] 48 of secondary dengue had DHF/DSS (figure 3)

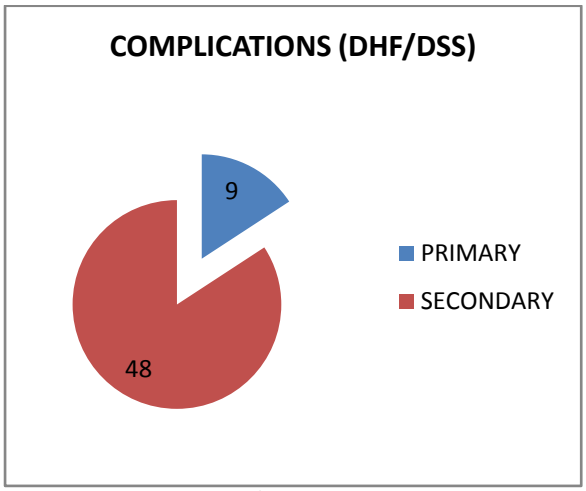

Figure 3: Distribution of complications (DHF/DSS) in primary & secondary dengue

CONCLUSION

Headache, abdominal pain, vomiting, malena, pleural effusion, ascites, elevated SGOT, elevated haematocrit & thrombocytopenia were found in higher proportions in secondary dengue, which was statistically significant. Leucopenia was observed more in primary dengue cases, though not statistically significant. Clinical symptoms like myalgia, bodyache and arthralgia were found to be equally distributed among the two study groups. Complications (DHF: dengue haemorrhagic fever & DSS: dengue shock syndrome) were more in secondary dengue cases.

REFERENCES

1. U C Chaturvedi, R Shrivastava. Dengue haemorrhagic fever: A global challenge. Indian Journal of Medical Microbiology 2004;22(1):5-6
2. Dengue in Kerala: a critical review. ICMR Bulletin April-May 2006;36:1-19
3. Sreenivasan M A, Rodrigues F M, Venkateshan C N, Paniker C J. Isolation of dengue virus from Trichur district (Kerala state). Indian J. Med Res 1979;69:538-541
4. http://www.who.int/csr/resources/publications/dengue/012-23.pdf
5. ChitsanuPancharoen, Jutarat Mekmullica, UsaThisyakor. Primary dengue infection: what are the clinical distinctions from secondary infection. Southeast Asian J Trop Med Public Health September 2001; 32(3):476-480
6. Khoa T D Thai, Hoang Lan Phuong, Tran ThiThanhNga et al. Clinical, epidemiological &virological features of dengue virus infection in Vietnamese patients presenting to primary care facilities with acute undifferentiated fever. J Infect March 2010; 60(3):229-237
7. Tripathi B K, Gupta B, Sinha R S, Prasad S, Sharma D K. Experience in adult population in dengue outbreak in Delhi. J Assoc Physicians India March 1998;46(3):273-276
8. R B Dominigues, G W Kuster, F L Onuki de Castro, V A Souza, J E Levi, C S Pannuti. Headache features in patients with dengue virus infection. Cephalgia 2006;26:879-882
9. Use of chest & abdominal ultrasound for identifying cases of dengue haemorrhagic fever, Health and Science bulletin June 2004; 2(2):10-13
10. M Saito, K. Oishi, S. inoue. Association of increased platelet associated immunoglobulin with

thrombocytopenia and severity of disease in secondary dengue virus infection. Clinical & experimental immunology November 2004;138(2): 299-303
11. Gholson C F, Provenza J M, Bacon B R. Hepatologic considerations in patients with parenchymal disease undergoing surgery. Am J Gastroenterol 1990;85:487-496
12. S L Seneviratne, G N Malavige, H J de Silva. Pathogenesis of liver involvement during dengue viral infection Transactions of the Royal society of Tropical Medicine & Hygeine 2006;100:608-614
13. Adrian Onga, MyaSandarb, Mark I Chenb, Leo Yee Sina Fatal dengue haemorrhagic fever in adults during a dengue epidemic in Singapore. International journal of infectious diseases 2007;11(3):263-267

How to cite this article: Sheeba PM, Arun B, Prathyusha K. A comparative study of primary & secondary dengue in a tertiary care centre. Int J Health Sci Res. 2015; 5(12):153-157.

****