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Paediatrics

A CO-INFECTION MODEL OF DENGUE FEVER: AN OBSERVATIONAL STUDY

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ABSTRACT **Background:** Dengue fever is a major public health problem in India. Suspicion, attention, and early testing are necessary to identify concurrent illnesses with dengue. This study was evaluated for other infections associated with dengue fever to minimize morbidity and mortality. **Materials and Methods:** Initially hospitalized patients with fever were selected. After clinical and laboratory evaluation, cases of fever with positive dengue NS1 or IgM were included. Among the 240 dengue patients; During follow-up, some patients presented with persistent high fever, cough, dysuria, onset/deepening of jaundice, and other toxic features that could not be correlated with dengue. The pertinent investigations were carried out to know the co-infections between them. **Results:** Coinfection was found in 16.66% of the cases, in the age group of 5 to 13 years, with a predominance of females. Dengue NS1 was positive in 30% and IgM positive in 62.5% of cases. Among the cases of dengue as coinfection, typhoid fever was found in 35%, paratyphoid fever in 7.5%, rickettsial fever in 15%, HAV infection in 25%, HEV infection in 10%, UTI in 5%, and bacterial pneumonia in 2.5%. **Conclusion:** The study shows that patients with dengue have a higher risk of having other infections. Seventeen percent of dengue patients were found to be associated with different coinfections.

KEYWORDS : Dengue; Coinfection; Typhoid

Introduction:

Acute febrile illness is the most common clinical syndrome among patients attending hospitals in developing countries [1]. Acute febrile illness is caused by a variety of bacterial, viral, and parasitic agents [2]. Patients with coinfection have atypical manifestations that delay diagnosis [3]. Coinfections of dengue with Chikungunya, malaria, and other arboviruses have been frequently reported in endemic areas [4, 5]. Coinfections of typhoid fever with several enteric viruses have been documented [6]. Dual infections tend to have prolonged fever and a higher risk of complications [7]. Physicians need to know the prevalence of dual infections to make a timely diagnosis in order to initiate appropriate treatment. This study was evaluated to discover the other infections associated with dengue fever to minimize morbidity and mortality.

Materials & Methods:

An observational study was conducted at Hospital J K, L N Medical college Bhopal MP India from September 2020 to March 2021. It was approved by institutional medical ethics committee. A written informed consent was obtained from all the parents. Children admitted with fever were included in this study. After clinical and laboratory evaluation among patients with NS1-positive dengue fever and IgM-positive dengue fever who had no history of fever in the past 1 to 3 months were included in our study. Dengue fever with only dengue IgG positive and non-dengue fever cases were excluded from this study. During the follow-up of these 240 dengue cases, we observed that some dengue patients had persistent high fever and/or cough or burning on urination or onset/deepening of jaundice, arthritis/arthralgia, and some other toxic features that could not be correlated with symptoms. of dengue. These raise our suspicion that there could be other associated infections. Some relevant investigations were then carried out accordingly to discover co-infections. Blood culture, widal test/fever antigen, SGPT, PT, serum bilirubin, anti-HAV IgM, anti-HEV IgM, urine culture, chest X-ray were sent. Dengue patients with coinfection was our case study (N). Data was analyzed using SPSS v.20 software.

Results:

There are total 240 dengue patients. We divided these patients into two groups. Group A had 200 (83.33%) dengue patients without co-infection, and group B had 40 (16.66%) patients with co-infection. Age of group B patients was found 5 years to 13 years, where 15 (37.5%) were male and 25 (62.5%) were female. The male-female ratio was 1: 1.6. Among the dengue with co-infection group; typhoid fever 14(35%), paratyphoid fever 3(7.5%), typhus/ rickettsial fever 6(15%), Hepatitis A virus infection 10(25%), Hepatitis E virus infection 4(10%), urinary tract infection 2(5%), bacterial pneumonia 1(2.5%) was found as co-infection Among the cases of dengue fever with co-infection group; anti dengue IgM was found positive in 25 (62.5%) cases and dengue NS1 positive in 12(30%). During screen for co-infection blood culture was found positive for salmonella typhi 6(15%), salmonella paratyphi A 3(7.5%). Widal test was reactive (high rising titer) in 8(20%), weil-Felix reaction (high rising titer) 6(15%), anti HAV IgM positive 10(25%), anti HEV IgM positive4(10%). Urine culture was found positive for E.coli 2(5%) and blood culture positive for Streptococcus Pneumoniae 1(2.5%).

Discussion

In this study, coinfection was found in 40 (16.66%) cases of dengue with a male-female ratio of 1:1.6. In this study, among the 40 dengue patients with co-infection; fourteen patients had typhoid fever and three patients had paratyphoid fever. In a tertiary care facility at J k Hospital Bhopal. Vigna et al. reported two confirmed cases of dengue with typhoid coinfection [9]. Bansal R. et al. also reported two confirmed cases of typhoid fever with dengue fever as a coinfection [10]. Three patients also had typhus/rickettsial fever with dengue fever [10]. The Weil-Felix reaction was found to be reactive with a high titer. Coinfection with dengue and scrub typhus was observed in an overseas study where scrub typhus was positive [11]. Coinfections may vary across geographic locations and countries. The full screen resulted in 104 publications that met the eligibility criteria and reported co-infections of malaria/dengue, dengue/chikungunya, and malaria/dengue/chikungunya. Most of the studies were reported in India [12]. A study in Karnataka, India, reports on two children with concurrent dengue and vivax malaria [13]. In our study, no cases of malaria were found as co-infection. Two patients with urinary tract infection in our study with dengue. Dengue fever and concurrent urinary tract infection were also reported by Wiwinitkit S et al. in his studio [14] In this study, a patient with dengue fever with bacterial pneumonia diagnosed by positive blood culture for Streptococcus Pneumoniae was found. Miyata N et al. experienced a case of bacterial pneumonia after dengue fever as a complication and that cavity-forming pneumonia due to Staph. aureus. [15]. Coinfection with pneumonia due to Staphylococcus aureus and dengue virus found in another study [16]. In our study, dengue with acute viral hepatitis (Hepatitis A virus infection) was found in 10 patients, diagnosed by positive Anti-HAV IgM. Goal G. reported a case of a 4-year-old boy partially recovered from HAV infection who subsequently developed dengue virus infection. His condition was complicated by an acute fulminant condition liver failure and that was probably the first pediatric fatal case of hepatitis A virus (HAV) with dengue virus coinfection [17]. Dengue fever and hepatitis A infection as a concurrent infection was also found in a girl from four years [18]. From Karnataka, India Bhat YEAR reported a case of coinfection of dengue with Hepatitis A virus with marked alterations in liver function [13]. In this study, dengue with acute Hepatitis E virus infection was also found in four patients. In Pakistan, Yakoob J. et al. reported a case in which dengue fever occurred concomitantly with hepatitis A and hepatitis E

virus infection [19]. In the case of dengue fever and hepatitis, the widal test may be falsely positive . Anti HEV IgM positive can be false positive in dengue fever. So, a clinical correlation was made in these cases in our study. Limitation This was a single center study with a small sample size. The severity and outcome of coinfections could not have been mentioned in our study. Other concurrent viral infections with dengue virus could not be identified as virus isolation could not be possible in our settings.

Conclution:

The study shows that dengue patients have a higher risk of having other infections. Sixteen point six percent of dengue patients were found to be associated with coinfections. Typhoid fever, paratyphoid fever, rickettsial fever, viral hepatitis A and E, bacterial pneumonia, and urinary tract infection were found to be co-infected with dengue fever. Therefore, dengue patients should be closely monitored and managed accordingly when associated with co-infections.

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REFERENCES:

1. Sharma Y, Arya V, Jain S, Kumar M, Deka L, Mathur A. Dengue and Typhoid Co-infection- Study from a Government Hospital in North Delhi. J Clin Diagn Res 2014 Dec;8(12):DC09–11.
2. Parker TM, Murray CK, Richards AL, et al. Concurrent infections in acute febrile illness patients in Egypt. Am J Trop Med Hyg 2007 Aug;77(2):390–2.
3. Lee IK, Liu JW, Yang KD. Clinical characteristics and risk factors for concurrent bacteremia in adults with dengue hemorrhagic fever. Am J Trop Med Hyg 2005 Feb;72(2):221–6.
4. Vaddadi s, Vamsi K, Raju CHN, Teja PS, Usha V. A rare case of triple infection with dengue, malaria and typhoid- A case report. Int J Res Dev Health 2013 Nov;1(4):200–3.
5. Bhalla A, Sharma N, Sharma A, Suri V. Concurrent infection with dengue and malaria. Indian J Med Sci 2006 Aug;60(8):330–1.
6. Basuki PS. Concurrent dengue infection and enteric fever. a case series. Folia Medica Indonesiana 2003 Mar;39(1):54–60.
7. Bansal R, Bansal P, Tomar LR. Typhoid and dengue coinfection: case reports. Trop Doct 2015 Jan;45(1):52–3.
8. Vigna Seshan R.V, Gopalsamy S, Srikanth P. Dengue and typhoid co-infection: A case report from a tertiary care hospital, India. Int J Case Rep Images 2016; 7: 563-5.
9. Bansal R, Bansal P, Ramkumarsingh Tomar L. Typhoid, and dengue co-infection: Case reports. Tropical Doctor 2015; 45: 52-53.
10. Sapkota S, Bhandari S, Sapkota S, Hamal R. Dengue, and Scrub Typhus Co-infection in a Patient Presenting with Febrile Illness. Case Reports in Infectious Diseases 2017;5:1-3.
11. Salam N, Mustafa S, Hafiz A, Chaudhary A, Deepa F, Parveen S. Global prevalence and distribution of coinfection of malaria, dengue and chikungunya: a systematic review. BMC Public Health 2018; 18: 710.doi.org/10.1186/ s12889-018-5626-z
12. Bhat YR, Varma C, Bhatt C.Dengue fever with coinfections: A case series in children.JMID. 2014; 1: 62-4.
13. Wiwanitkit S, Wiwanitkit V. Dengue, and concurrent urinary tract infection. Asian Pac J Trop Dis. 2013; 3: 323.
14. Miyata N, Yoshimura Y, Tachikawa N, Amano Y, Sakamoto Y, Kosuge Y. Cavity Forming Pneumonia Due to Staphylococcus aureus Following Dengue Fever. Am J Trop Med Hyg. 2015; 93:1055-57.
15. Nagassar RP, Bridgelal-Nagsaar RJ, Mc-Morris N, Royegreen K. Staphylococcus aureus pneumonia and dengue virus co-infection and review of implications of coinfection. BMJ Case Reports 2012.
16. Goal G. A fatal hepatitis A virus with dengue fever coinfection. Case report 2019. Doi:10.1016/j.idcr.2019. e00522.
17. Zaki SA, Lad V. Concurrent infection of dengue fever and hepatitis A infection: A case report. Indian JCrit Care Med. 2011; 15:238-40.
18. Yakoob J, Jafri W, Siddiqui S, Riaz M. Dengue Fever with Hepatitis E and Hepatitis A infection. Journal of the Pakistan Medical Association2009; 59:76-7.