Dengue Fever with Concomitant Ef:a Diagnostic Dilemma

Qazi Sazib Ahamed and Sidratul Muntaha Sejuti

Abstract

Concurrent contamination with two agents may contribute to an disease with similar signs causing a medical problem for the practitioner being examined. Dengue symptoms that resemble other conditions such as leptospirosis, influenza A, Salmonella Typhi, Japanese encephalitis, chikungunya, and malaria. Co-infection should also be taken into account when treating dengue or enteric fever cases with or Individuals living in infectious regions are at risk of developing such infections either concurrently or being superimposed over a persistent acute infection.This research was conducted to track Enteric fever, malaria, and dengue patients with co-seropositivity and to monitor the baseline Salmonella antibody titer of voluntary blood donors serving the region's general population. The present research was performed in the microbiology section,, Davangere Medical College J.J.M. Of the 824 febrile patients diagnosed with a positive serological examination for either typhoid, dengue or malaria, 189 patients were found to be co-seropositive to either of the above-mentioned diseases when immunochromatography was used to check their serum, Dengue ELISA and malaria antigen.. A total of 189 patients showed a co-seropositivity of 22.90 per cent for any of the above mentioned diseases. Typhoid-Dengue was reported to be 6.67% in 9.83% Typhoid-Malaria and 0.48% in all three. Dengue- Co-seropositivity of malaria was recorded at 5.94%. In stable community the basal titer was estimated to be < 1:20. The co seropositivity rate in our study is 22.9% which poses a challenge in the diagnosis and treatment of such patients. As the gold standards culture and microscopy are time consuming and molecular diagnostic tools not a practical reality in many rural and developing primary health centers, simple, rapid and sensitive serological methods are being used as an alternative diagnostic tool in diagnosing atypical co infections which in some instance leads to overwhelming diagnosis of co infections and improper treatment.

Introduction

Concurrent contact with two agents may contribute to an disease with similar signs causing a medical problem for the practitioner being handled. Acute febrile condition (AFI) is a popular clinical syndrome among Indian patients seeking hospital treatment. Dengue is one such illness that typically includes flu-like signs with high-grade fever, general body ache, diarrhea , and vomiting, as well as maculopapular rashes. Dengue symptoms may resemble certain diseases such as leptospirosis, influenza A, SalmonellaTyphi, Japanese encephalitis, chikungunya, and malaria that are often widespread in endemic areas[1,2]. The similarity in symptoms and differential diagnoses of these diseases often mimic those of dengue and thus makes accurate clinical diagnosis and treatment difficult without laboratory confirmation, Emerging and re-emerging diseases are a concern in Asia during a dynamic time of population growth , urbanization and global migration. This, in effect, strengthens the need for continuing foreign surveillance and development of public health infrastructures to tackle current and potential emerging threats to diseases. Throughout certain areas of the world Dengue co-infection with malaria and other arboviral diseases has been reported. Epidemiology, course of disease and complications is researched and documented separately for both diseases. Typhoid, tuberculosis, and dengue fever are probably the tropics' most infectious diseases. They do have similar clinical presentation, though caused by different agents. Etiological diagnosis is important for the management of these diseases associated with population density, urbanization, endemicity and mobility, all of which favor the spread of the disease1.

Despite the advent of fast serodiagnostic testing for such infections, it has been found that samples of patients often display seropositivity for two or three infections that face clinical diagnosis and care difficulties. The causes could be endemicity of the disease leading to increased levels of IgG antibodies and the sharing of antigen and cross-reaction antibodies.

Weak treatment in the tropics tends to hinder management of tuberculosis, typhoid, and dengue. This is attributed to a variety of factors including non-specific clinical appearance of the diseases , high incidence of asymptomatic infection in certain regions, shortage of funding and limited exposure to qualified health care professionals and health facilities, widespread practice of self treatment for clinically suspected malaria and typhoid fever.2.

Baseline titer of Salmonella antibodies for analysis of meaningful / diagnostic titer are not often accessible in each area and stay unrevised together for decades. Tests utilizing rapid antigen identification, identification of post-infection IgM antibodies and analysis of baseline titers for laboratory diagnosis may serve as alternatives to these difficulties. Seropositivity of more than one of the aforementioned measures renders it impossible of treat both the laboratory and the surgical. This research was therefore performed in Davangere to determine the prevalence of combined Dengue and Malaria infections in Enteric fever patients.2.

Discussion

Concurrent infection with two agents can result in an illness having overlapping symptoms creating a diagnostic dilemma for the treating physician. The symptoms of dengue may mimic other diseases such as leptospirosis, influenza A, SalmonellaTyphi, Japanese encephalitis, chikungunya and malaria. There is paucity of data regarding dengue and typhoid co- infection both in the developed and developing countries.

Co-infection with or without atypical features should always be kept in mind when dealing with cases of dengue or enteric fever. To reduce the burden of disease, emphasis should be placed on vaccination against typhoid along with improved sanitation and personal hygiene.Children are often infected with other viruses and bacteria that cause the upper respiratory symptoms at the same time. Reports of recurrent dengue virus infection with a flavivirus, Chikungunya and numerous bacteria, including SalmonellaTyphi, have been documented earlier.

Typhoid / enteric fever is typically caused by S. Typhi, and less so from S. Paratyphi y S. The choleraesuis. Symptom initiation is gradual, with a 10-14d incubation. Fever remains unremittent; temperature rises are not returning to usual (saddle back fever). Dengue fever, by comparison, presents as a continuum of illness varying from inapparent to moderate febrile condition to serious and lethal hemorrhagic disorder. In a common dengue fever situation, the patient develops high fever that lasts for 5-7d. A serious frontal and retro orbital headache, myalgia, particularly lower back, arm and leg pains, nausea, arthralgia and anorexia can also accompany. A sluggish, persistent frontal headache in typhoid fever occurs within the first two days of fever; moderate arthralgia involving multiple joints and ambiguous, poorly localized back pain can occur. Constipation is more severe than diarrhea; it occurs in about 50 percent of typhoid cases, while diarrhea occurs in about 30 percent. Constipation is often recorded in dengue fever; diarrhea and respiratory symptoms are commonly documented and may be attributed to concurrent infections. Which are critical when preparing vaccination research on a wide scale and when designing health policies. Unless treated early, dengue and typhoid combined can contribute to involvement of multiple organs and more undesired consequences. Co-infection with the dengue-typhoid is a preventable cause of death. To the best of our knowledge, though further studies are required.

Enteric fever continues to be a public health issue in middle and low-income countries. In this research, we note that reported or laboratory-confirmed enteric fever was responsible for around 4 percent of all hospitalizations between 2013 and 2014 at the 2 largest pediatric hospitals in Dhaka , Bangladesh. We also report that more than 60 percent of culture-positive cases have confirmed enteric fever and that SalmonellaTyphi was the identified primary pathogen. Although 3 patients died during hospitalization, in laboratory-confirmed cases of typhoid or paratyphoid, none of those deaths were reported.In general, our study finds that a large percentage of infectious diseases in Dhaka can be attributed to enteric fever, consistent with single-center studies previously conducted in Bangladesh . For example, between January 2005 and December 2014, one analysis gathered blood specimens from 103,679 hospitalized and non-hospitalized patients visiting the icddrb-connected hospital and noticed that 13.6% of cultivated blood samples were healthy, with SalmonellaTyphi being the most frequently isolated microorganism (36.9% of healthy blood samples).

Among the hospitalized enteric fever cases, the majority were younger than 5 years, which is consistent with earlier studies .The overall isolation rate of SalmonellaTyphi and SalmonellaParatyphi A was lower than that reported by 3 studies. This may be because the surveillance was not planned to systematically identify enteric fever cases in all pediatric hospitalized patients. The proportion of laboratory-confirmed cases was lower in children who lived outside Dhaka compared to that in the children that lived within Dhaka. This is possibly due to the fact that the cases who come from outside Dhaka are usually referred from other hospitals and thereby treated with antibiotic before referral. It is likely that this prior treatment with antibiotic reduced the chance of yielding a positive growth in blood culture.

Name: Qazi Sazib Ahamed and Sidratul Muntaha Sejuti

Afiliation: Anwer Khan Modern Medical College, Bangladesh Email: ahamed.sazib1@gmail.com

This study is not without limitations. Reliance on existing hospital surveillance databases may lead to missing data on key clinical characteristics. Moreover, the study only collected information of cases that were hospitalized at pediatric medicine IPDs. Many enteric fever cases receive treatment at outpatient departments (OPD) and are generally not hospitalized (Saha S et al, submitted). Some cases might have been admitted to the surgery department for complications of enteric fever and were not included in the ongoing surveillance. Inclusion of enteric fever cases that were treated at the OPD or other departments is likely to provide a more comprehensive overview of the spectrum of the disease. The SEAP Phase II is specifically designed for identification of enteric fever and is expected to address these limitations by estimating the burden and severity of enteric fever through comprehensive enteric fever surveillance.

References

[1] Kariuki Samuel. Typhoid fever in sub-Saharan Africa: challenges of diagnosis and management of infections. J Infect Developing Countries. 2008;2(6):443–47. [PubMed] [Google Scholar]

[2] Capeding MR, Chua MN, Hadinegoro SR, et al. Dengue and other common causes of acute febrile illness in Asia: an active surveillance study in children. PLoSNegl Trop Dis. 2013;7(7):e2331. [PMC free article] [PubMed] [Google Scholar]

[3] Chrispal A, Boorugu H, Gopinath K, et al. Acute undifferentiated febrile illness in adult hospitalized patients: the disease spectrum and diagnostic predictors – an experience from a tertiary care hospital in South India. Trop Doct. 2010;40(4):230–34. [PubMed] [Google Scholar]

[4] Shrishu R, Kamath, Ranjit S. Clinical features, complications and atypical manifestations of children with severe forms of dengue hemorrhagic fever in South India. Indian J Pediatr. 2006;73(10):889–95. [PubMed] [Google Scholar]

[5] Morgenstern R, Hayes PC. The liver in typhoid fever: always affected, not just a complication. Am J Gastroenterol. 1991;86(9):1235–39. [PubMed] [Google Scholar]

[6] Rodrigues C. The Widal test - more than 100 y old: abused but still used. J Assoc Physicians India. 2003;51:7–8. [PubMed] [Google Scholar]

[7] Kasper RM, Blair JP, Touch S, et al. Infectious etiologies of acute febrile illness among patients seeking health care in south-central cambodia. J Trop Med Hyg. 2012;86(2):246–53. [PMC free article] [PubMed] [Google Scholar]

[8] Baba M, Christopher H, Oderinde B, et al. Evidence of arbovirus co-infection in suspected febrile malaria and typhoid patients in Nigeria. J Infect DevCtries. 2013;7(1):51–59. [PubMed] [Google Scholar]

[9] Ahmed F, Chowdhury K, Alam JM, et al. Co-infection of typhoid fever with hepatitis A, hepatitis E and dengue fever: A challenge to the physicians. Am J Trop Med Hyg. 2012;86(2):246–53. [Google Scholar]

[10] Sudjana P, Jusuf H. "Concurrent dengue hemorrhagic fever and typhoid fever infection in adult: case report." Southeast Asian Journal of Tropical Medicine and Public Health. 1998;29(2):370–72. [PubMed] [Google Scholar]

[11] Gubler DJ. Dengue and dengue hemorrhagic fever. ClinMicrob Rev. 1998;11(3):480–96. [PMC free article] [PubMed] [Google Scholar]

[12] Richman DD, Whitley RJ, Hayden FG. "Flaviviruses" in Clinical Virology. New York, USA: Churchill Livingstone; 1997. pp. 1133–86. [Google Scholar]

[13] Gomez HF, Cleary TG, Saunders WB. Salmonella. In Feigin: Textbook of Pediatric Infectious Diseases. 1998;4:1321–24. [Google Scholar]

[14] Basuki PS. Concurrent dengue infection and enteric fever. A case series. Folia MedicaIndonesiana. 2003;39:54–60. [Google Scholar]

[15] Dutta S, Sur D, Manna B, et al. Evaluation of new-generation serologic tests for the diagnosis of typhoid fever: data from a community-based surveillance in Calcutta, India. DiagnMicrobiol Infect Dis. 2006;56:359–65. [PubMed] [Google Scholar]

[16] Mohan B, Patwari AK, Anand VK. Hepatic dysfunction in childhood dengue infection. J Trop Pediatr. 2000;46:40–43. [PubMed] [Google Scholar]

[17] Dinh The Trung, Le Thi Thu Thao, Tran TinhHien, et al. Liver involvement associated with dengue infection in adults in vietnam. Am J Trop Med Hyg. 2010;83(4):774–80. [PMC free article] [PubMed] [Google Scholar]

[18] Mtove G, Amos B, von Seidlein L, et al. Invasive salmonellosis among children admitted to a rural tanzanian hospital and a comparison with previous studies. PLoS ONE. 2010;5(2):e9244. [PMC free article] [PubMed] [Google Scholar]

[19] Morpeth S, Ramadhani HO, Crump JA. Invasive non-typhiSalmonella disease in africa. Clin Infect Dis. 2009;49:606–11. [PMC free article] [PubMed] [Google Scholar]