

“Dengue and malaria co-infections study at a tertiary care hospital at Kanpur”.

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Abstract

Background: Malaria and Dengue are the most prevalent vector-borne diseases worldwide and represent major public health concern. Both are endemic in tropical regions. Now co-infection cases have been reported around the world. Co infection of malaria and dengue cause more severe than the mono infection.

Aim: To find the incidence of dengue and malaria co-infection at a teaching care hospital Kanpur. **Material**

and Methods: A prospective study was carried out in a tertiary care hospital, Kanpur. Study was conducted between months January 2017 to December 2018. A total 200 serum samples clinically suspected to have acute febrile illness. All samples were tested for dengue NS-1 antigen ELISA before 5 days of onset of illness and for dengue IgM ELISA and Malaria infection by peripheral blood smear and Rapid card test.

Results: out of 200 patients Only 27% (54) patients with fever were tested positive for dengue and 20% (40) were tested positive for malaria. 4 % (8) dengue cases show concurrent infection with malarial parasites. Hepatomegaly and jaundice 10-15%, haemorrhagic manifestations % (4), haemoglobin <12 g/dl 60-85% (80) and thrombocytopenia (platelet count <150,000/cmm) (80-50) were common in malaria and dengue co-infections and were much more common in *Plasmodium falciparum* infections. **Conclusion:** Concurrent infection with malaria and dengue can result in severe illness having overlapping symptom that causes difficulty in diagnosis and treatment. Failure or delay to recognize malaria or dengue co-infection would delay the initiation of proper therapy that may increase chance of severity of bleeding.

Key Words:- Dengue, Malaria, Co-infection

Introduction:-

Malaria and dengue fever are the most wide-spread vector-borne diseases and represent major public health problems. ^[1] DENV is a *Flavivirus* of the family *Flaviviridae* and is prevalent in tropical and subtropical regions in Asia. ^[2] It is estimated that there are 50–100 million cases of dengue fever (DF) reported per year worldwide, including more than 500,000 cases of severe dengue hemorrhagic fever (DHF) and dengue shock syndrome (DSS). Since 1996, dengue has been reported widely prevalent in different parts of India. Malaria and Dengue both are endemic in India. ^[3] In 2005 first case of dual infection were described. ^[4] Co-infection malaria and dengue can be more severe than single infection. The severity of co-infection

occurs due to overlapping symptoms that may clinically indistinguishable. Malaria and dengue are endemic in similar tropical regions, and therefore, may result in the possibility of co-infection. Both diseases can cause acute febrile illness. However, malaria can be chronic while dengue cannot. Despite similar clinical presentation the course of treatment is entirely different for both diseases. Malaria is treated using antimalarial drugs. In case of Dengue and no vaccine or drug is available and clinicians rely on supportive therapy [5,6]. Co-infection has been reported to be more severe than single infection with severe thrombocytopenia and anaemia. [7]

Methods: The study of Dengue, malaria and their co infection was carried out during the August 2017 to January 2018 in the Department of microbiology at Rama Medical College, Hospital and research center, Mandhana Kanpur. This was a prospective study. serum samples from clinically suspected cases of fever compatible with malaria and/or dengue were collected. All samples were tested for dengue NS-1 antigen before 5 days of onset of illness and for dengue IgM after 5 days of onset of illness. In all samples, malaria diagnosis was based on the identification of *Plasmodium* parasites on a thin and thick blood films microscopy. And Rapid card test for both infection.

Results: Out of total, 200 patients were included in our study. Among them, 40(45%) had *P. vivax* Malaria, 54 (%) Dengue fever and only 8 (8%) cases showed concurrent infection with dengue virus and malaria (*Plasmodium* parasites). *Plasmodium Vivax*

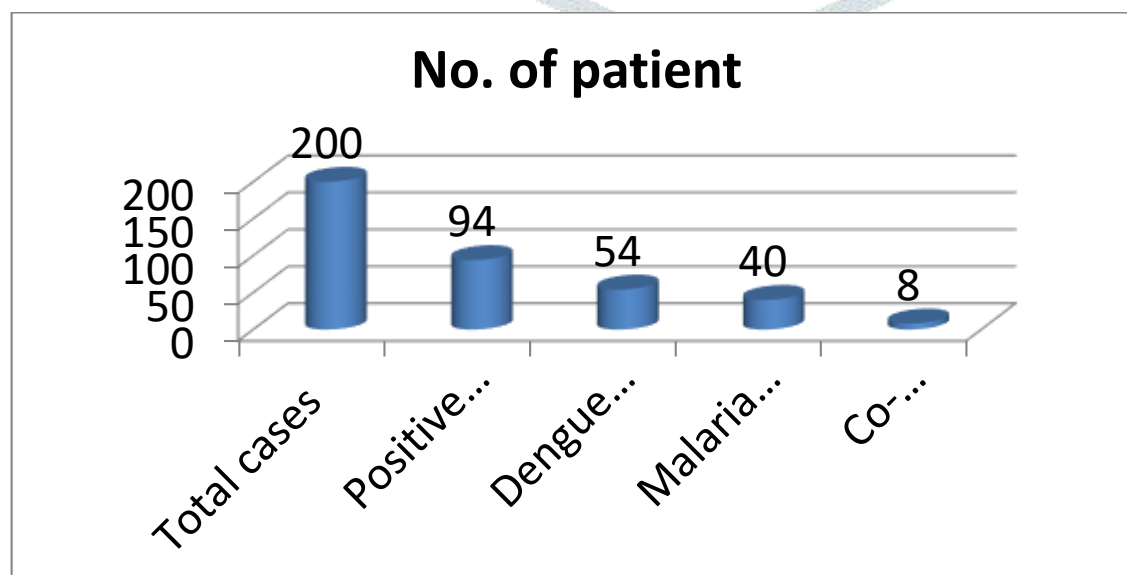


Fig 1:- Total Distribution of Dengue and Malaria cases

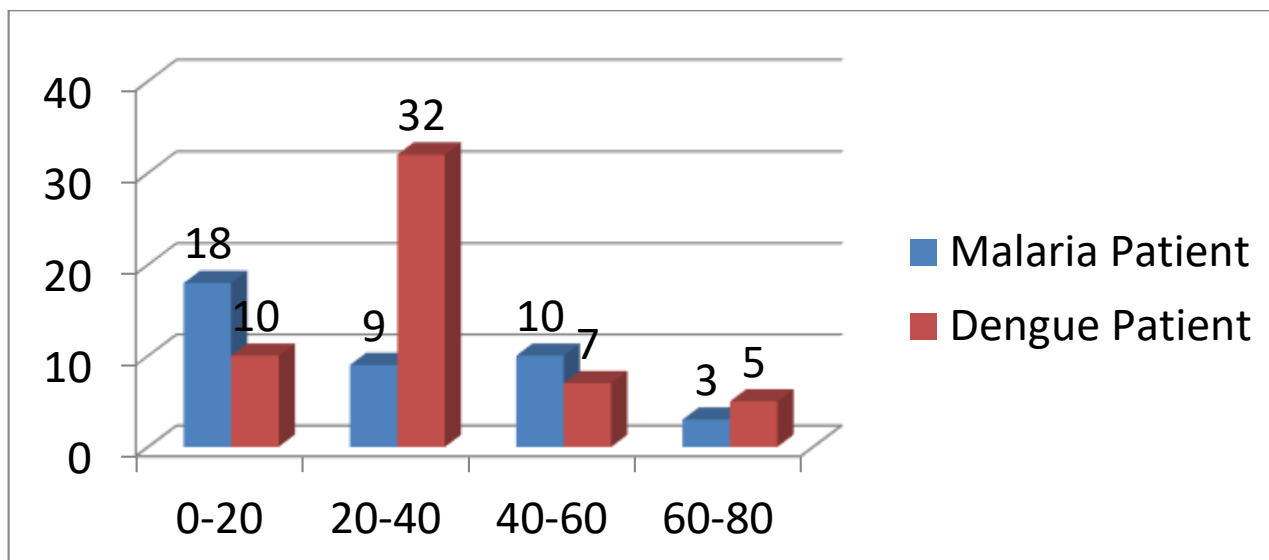


Fig 2 Age wise Distribution of Dengue & Malaria Patients

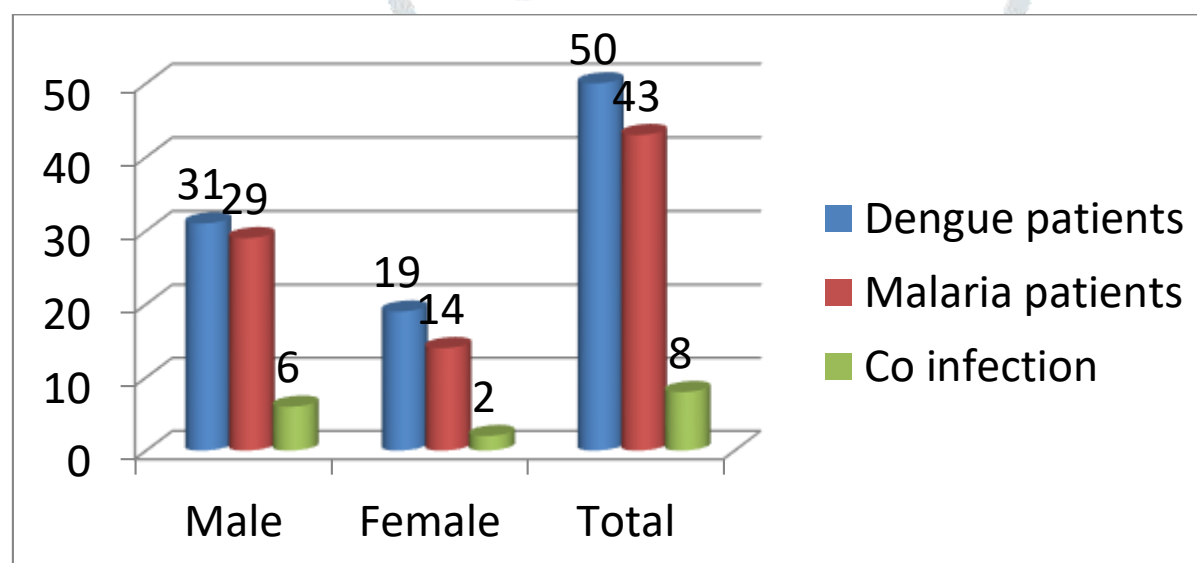


Fig 3: Gender wise Distribution of cases

Investigation	No of Dengue Cases	No of Malaria cases	Co - infection
Hemoglobin (<9.0 gm%)	75	56	8
Leucocytosis (> 12,000/ μ l)	30	38	5
Thrombocytopenia(1×10^3)	75	47	8
Billirubin(>1.2mg%)	18	38	4
SGPT/SGOT(>40IU/I)	51	40	4
Serum Albumin (<3gm%)	28	20	4
Hepatomegaly and jaundice	10	15	6
Low blood pressure (<100/60mm Hg%)	80	50	8

Table 4: Investigation findings of total patients

Discussion:-

Dengue and malaria, both are preventable vector-borne diseases. Coexistence of both is very important to understand as both have almost similar signs and symptoms but entirely different treatment protocols. Simultaneous presence of both the infections in one individual can easily be missed as detection of any one of them in an acute febrile patient can mask the diagnosis of other. This study reveals that in 200 out of 94 patients were included in our study. Among them, 40(20%) had *P. vivax* Malaria infection, 54 (27%) Dengue fever infection, and 8 (4%) were co-infected. The Rapid test had positive for *Plasmodium vivax* and negative for *Plasmodium falciparum* infection. It was also observed that among both co infected cases, *Plasmodium vivax* was seen, whereas NS1 and IgM were positive in all cases. According to Nasir Salam et.al reported *P. vivax* as the infecting species alongside coinfecting arbovirus.^[8]

The first case of concurrent dengue and *Plasmodium falciparum* was published by Charrel et al. in 2005 [9] In present study found co-infection between age group 20-60 ages [10]. This result correlated with Ali et al and was in contrasts with bhagat. et al.[11]

In this study the incidence of Dengue and Malaria co-infection was 4%. Parual D. Shah et al also reported 3.14% incidence of concurrent Dengue and malaria infection and contrasts with a Cross-Sectional Study in the Brazilian Amazon Belisa M. L. Magalhães et al found that co infection rate was 2.8% Similar to our study [12,13].

M Rajesh Kumar rao et al also found similar result like this study 22 (3.0%) cases were identified as dengue–malaria co-infection cases, out of which 13 were male and 9 were female. [14] R.sujatha et al also studied co-infection in male. [15]

Similar to this study Parual D. Shah et al also found Haemoglobin <12 g/dl in 100% (27) and thrombocytopenia (platelet count <150,000/cmm) in 96.29% (26) cases. No mortality was detected in dengue and malaria co-infection cases. [12]

Conclusion:-

Malaria and dengue co-infection is a relatively common event. Concurrent infection with malaria and dengue can result in severe illness having overlapping symptom that may causes difficulty in diagnosis and treatment. Failure or delay to recognize malaria or dengue co infection would delay the initiation of proper therapy that may increases chance of severity of bleeding and other consequences. It result increase morbidity and mortality. Hence chance of concurrence of infection should be kept in mind during diagnosis and treatment.

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