To Study of the Correlation between Vitamin B12 Level and Thrombocytopenia in Dengue Fever and Malaria

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Abstract: Introduction: Thrombocytopenia is a common symptom of malaria, and typically occurs more frequently in Falciparam malaria. It appears that P. vivax does trigger thrombocytopenia, contrary to popular belief. Therefore, patients with low platelets and fever ought to be considered for malaria, though B12 deficiency does not always accompany malaria cases. Methods: This study was conducted at indoor patients at the NIMS hospital to investigate the relationship between vitamin B12 with thrombocytopenia associated with dengue fever and malaria. Patients were investigated for routine investigations such as CBC, ESR, RFT, RBS, LFT, PBF, VIT B12 LEVEL, Dengue profile and MP card test. In out of 125 patients, 75 patients have dengue fever, and 50 patients have malaria fever. Result: In dengue fever out of 75 patients, 61 patients (81%) had thrombocytopenia with vitamin B12 deficiency (B12 level <100 pg/l). In malaria out of 50 patients, 28 patients (56%) have thrombocytopenia with vitamin B12 level (B12 level <300 pg/l), 22 patients (44%) have thrombocytopenia with vitamin B12 level normal (B12 level 201-300). Vitamin B12 level < 190 pg/ml was found in 47(94%) patients with severe thrombocytopenia while 32 number (74%) patients with mild thrombocytopenia. In group with B12<190 pg/l need of SDP transfusion was significantly high i.e; (115.13±42.98) in comparison to other groups, as well as the recovery time of platelets to 20000/µl threshold, was found to be high in B12 <190 pg/ml group (42.60±8.89 days) as compared to other groups. Conclusion: Using platelet analysis by PBF, the results of this study were obtained. There is no clumping of platelets, and the platelets show the normal size, color, and shape.

Keywords: Falciparam malaria, thrombocytopenia, vitamin B12.

INTRODUCTION

Thrombocytopenia, defined as a platelet count of less than 150*109/L, has numerous causes, can be broadly divided into two types i.e; congenital and acquired. A deficiency in folate or vitamin B12 may also be associated with low levels of platelets in some cases. Vitamin B12 is essential for erythropoiesis and thrombopoiiesis. The incidence of thrombocytopenia in symptomatic B12 (cobalamin deficiency) is approximately 10%. B12 levels didn’t seem to be related to other dengue complications such as bleeding, septicemia, and shock. Apart from anaemia and leukopenia, severe vitamin B12 deficiency may also cause thrombocytopenia.

The goal of our study is
1. To assess the platelet morphology and counts in patients of dengue fever and malaria.
2. To correlate between vitamin B12 deficiency and severity of thrombocytopenia, platelets recovery and duration of hospital stay in dengue and malaria case.

MATERIALS AND METHODS

We carried out a prospective study over a period of 18 months, from January 2020 to Jun 2021; All the cases of dengue and malaria will be selected on the basis of selection criteria after detail history and clinical general and systemic examination of the patients. Patients will be investigated for routine investigations such as CBC, ESR, RFT, RBS, LFT, PBF, VIT B12 LEVEL, Dengue profile and MP card test. Clinical features, haematological and biochemical parameters and vitamin B12 levels will be measured. Data processing were performed using excel software.
RESULT

125 patients were collected. In out of 125 patients, 75 patients have dengue fever and 50 patients have malaria fever.

Fig 1: Age distribution of dengue patients

Fig 2: Age distribution of malaria patients

Fig 3: Diagram showing vitamin B12 level in the cases of dengue patients
DISCUSSION

In this study showed that vitamin B12 level deficiency in patients with thrombocytopenia. There are 125 patients with dengue fever, and 50 patients with malaria, out of whom 75 are infected. In dengue fever out of 75 patients, 61 patients (81%) have thrombocytopenia with vitamin B12 deficiency (B12 level 300 pg/l), 22 patients (44%) have thrombocytopenia with vitamin B12 level normal (B12 level 201-300). Vitamin B12 level < 190 pg/ml was found in 47(94%) patients with severe thrombocytopenia while 32 number (74%) patients with mild thrombocytopenia. In group with B12<190 pg/ l
need of SDP transfusion was significantly high i.e; (115.13±42.08) in comparison to other groups, as well as the recovery time of platelets to 20000/µl threshold, was found to be high in B12≥190 pg/l group (42.60±8.89days) as compared to other groups. In this study the finding were platelets analysis by PBF examination the platelets are normal in size, colour and shape as well as shown no presence of platelet clumping. Patients with dengue are often admitted because of thrombocytopenia and other symptoms relating to thrombocytopenia. In India, the duration of admission is often determined by the number of platelets recovered to a safe level (<20000/µl). There is no direct correlation between thrombocytopenia severity and dengue complications in several studies. The recovery from thrombocytopenia in some dengue patients is swift, while in others it may take several days. The hypothesis presented in this study was that there may be other factors contributing to acute haematological / hematopoietic stress that lead to thrombocytopenia and slow recovery. By identifying and removing contributory factors, patients with severe thrombocytopenia and dengue fever may be able to decrease the duration of their hospital stay. The severe lack of vitamin B12 is often associated with thrombocytopenia, as well as anemia and leukopenia. The Indian population is prone to vitamin B12 deficiency; therefore, this study was designed to test the hypothesis that the level of vitamin B12 in some people, may lead to prolonged, severe thrombocytopenia. When vitamin B12 levels were under 100 pg/L, SDP requirements were the highest in comparison to those with B12 levels >300 pg/L, but it was not statistically significant. SDP was transfused only if platelets remained below 10000/µl in current study, suggesting severe B12 deficiency prolongs severity of thrombocytopenia. An additional parameter measured, the platelets recovery time (time taken to reach >20000/µl), confirmed this finding. It was selected as part of in-patient treatment since the platelets recover above 20000/µl and if, in all other respects, the patient is considered fit to be discharged. Also, platelet recovery time was the fastest in B12≥300 pg/L (360±0days) based on statistical analysis.

**STUDY LIMITATIONS**

Patients with severe thrombocytopenia were tested for vitamin B12 levels in order to test our hypothesis. As a result, the sample size was small. This preliminary conclusion needs to be confirmed in a larger study. In order to determine vitamin B12 levels in large cohorts of dengue patients, plot them against platelet levels would be the most practical approach. The next step would be to see how these patients respond to injectable B12 supplementation. A mild to moderate form of thrombocytopenia often accompanies malaria, but it is rarely symptomatic. In our study, 56% of patients with malaria had thrombocytopenia, similar to others reporting low platelet counts of 57%9 and 48%. Malaria is usually associated with reduced blood counts of various degrees. There were 145 malaria patients in Liberia studied by Mahmood et al., There were 109 cases of thrombocytopenia (75.18%). The sensitivity of the platelet count as a malaria predictor was 80.11%, while the specificity was 81.36%. He concluded the extended search for malarial parasite in patients with thrombocytopenia on smear had a positive predictive value of 63.87% and a negative predictive value of 90.86%. In hospitalized patients, thrombocytopenia ranged from mild to severe, raising the possibility of malaria, due to the presence of P falciparum.

**CONCLUSION**

In dengue fever, there is a particularly high prevalence of thrombocytopenia, especially among Indians, which has been linked to vitamin B12 deficiency. B12 deficiency may require a prolonged hospital stay and increased healthcare costs as well as platelet transfusions. Thrombocytopenia is a common symptom of malaria, and typically occurs more frequently in F. malaia. It appears that P. vivax does trigger thrombocytopenia, contrary to popular belief. Therefore, patients with low platelets and fever ought to be considered for malaria, though B12 deficiency does not always accompany malaria cases.

**REFERENCES**


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