ejpmr, 2016,3(11), 221-224

SJIF Impact Factor 3.628

EUROPEAN JOURNAL OF PHARMACEUTICAL AND MEDICAL RESEARCH

www.ejpmr.com

Research Article

ISSN 2394-3211

EJPMR

ELEVATION OF LIVER ENZYMES IN DENGUE AND MALARIAL THROMBOCYTOPENIC PATIENTS

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Article Received on 16/09/2016 **Article Revised on 06/10/2016** **Article Accepted on 26/10/2016**

ABSTRACT

Objective: To determine the frequency of liver enzymes elevation in dengue and malarial thrombocytopenic patients. **Patients and Methods:** This cross sectional descriptive study was conducted from August 2013 to December 2013 at Fatimiyah hospital Karachi Pakistan. All patients aged between 15 and 60 years presenting with high grade fever and low platelet count for > 03 days duration on complete blood picture (CP) were included in this study and then underwent for further investigations of Liver function test, malaria parasite / ICT and dengue fever serology. The data was collected on pre-designed profroma and analysis was done using SPSS 17 version. **Results:** The main finding was mild to moderate hepatic impairment, assessed by serial measurements of liver enzyme levels was apparent in almost all dengue and malaria patients although the most abnormalities were noted later than during the generally critical period. Total 78 patients were identified as dengue fever and 10 patients were diagnosed as malaria while two patients has both dengue and malaria infection simultaneously. The mean ± SD for platelets count, SGPT, SGOT and ALP was 65.4 ± 39.7 and 50.10 ± 27.61 (p=0.2), 120.19 ± 10 and 58.50 ± 55.70 (p=0.06), 164.57 ± 228.9 and 64.0 ± 64.0 (0.1), 234.85 ± 154.33 and 214.70 ± 86.01 (p=0.6) in dengue and malarial thrombocytopenic individuals. **Conclusion:** In patients with dengue the liver function tests especially SGOT and SGPT (AST and ALT) were significantly deranged than malarial population. On the basis of these parameters it was observed that liver function profile is the best tool to assess the severity and spread of the dengue infection.

KEYWORDS: Malaria, dengue, thrombocytopenia, liver function test and platelets.

INTRODUCTION

Dengue fever (break bone fever) is an acute hemorrhagic viral illness transmitted through by Aedes Egypti.[1,2] It is the second most common arthropod borne infection after malaria and the fatal complications are dengue hemorrhagic fever and dengue septic shock.[3-5] The clinical presentation include fever, retro bulbar headache, body rashes myalgias, nausea and vomiting while the diagnostic criteria includes thrombocytopenia and hemoconcentration.[6,7] The multisystem involvement is reported in dengue since past few years includes cardiovascular and central nervous system manifestations and hepatic involvement.[8] In many dengue endemic areas, acute hepatitis observed to be a common complication and elevated hepatic enzymes including SGPT and SGOT are being investigated to be used as diagnostic criteria, although liver involvement prolongs the course of disease but does not alter the prognosis.[9,10]

The rationale of conducting this study is to determine the disturbance in SGPT and SGOT in thrombocytopenic patients which may guide to an early assessment for spread of dengue and malarial infection and lead to an adequate and appropriate treatment at an early stage that will reduce the risk of complication and benefit the patients as far as management is concerned.

PATIENTS AND METHODS

This cross sectional descriptive study was conducted from August 2013 to December 2013 at Fatimiyah hospital Karachi Pakistan. All patients aged between 15 and 60 years presenting with high grade fever and low

platelet count for > 03 days duration on complete blood picture (CP) were included in this study while the patients with a history of previous liver disease, any other infectious disease, connective tissue or blood diseases, thrombotic thrombocytopenic purpura (TTP), hemolytic uremic syndrome (HUS), patients were on aspirin, steroids and immunosuppressive therapy, disseminated intravascular coagulation (DIC) and non cooperative patients were excluded from the study. After meeting the inclusion criteria and the informed consent was taken from every patient and then underwent for further investigations of Liver function test, malaria parasite / ICT and dengue fever serology by taking 2cc venous blood sample in a disposable syringe, transferred to CP bottle and sent to laboratory for analysis. The data was collected on pre-designed profroma and all the maneuvers were performed under medical ethics. The data evaluation was done using SPSS 17 version, the frequencies, percentages and mean ±SD for calculated for the study variables. The non parametric statistical Wilcoxon signed-rank test was applied and the p-value ≤0.05 was considered as statistical significant.

RESULTS

This study observed the biochemical manifestations of dengue and malaria and the main finding was mild to moderate hepatic impairment, assessed by serial measurements of liver enzyme levels was apparent in almost all dengue and malaria patients although the most abnormalities were noted later than during the generally critical period. Total 78 patients were identified as dengue fever and 10 patients were diagnosed as malaria while two patients has both dengue and malaria infection simultaneously which had presented with thrombocytopenia and fever.

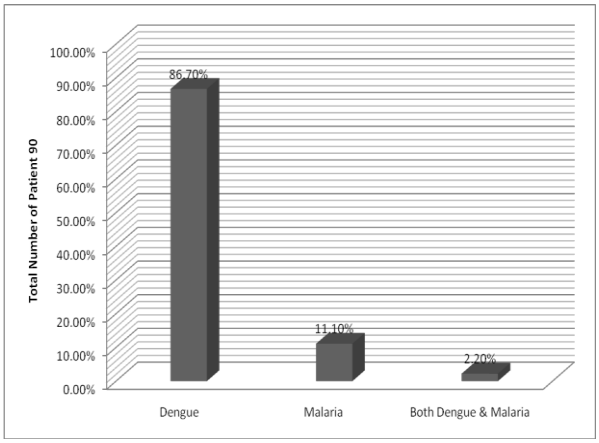

FIGURE 1: Distribution of the patients

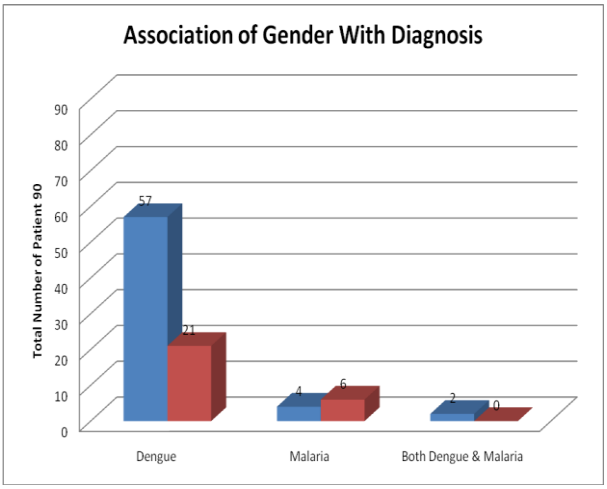

FIGURE 2: Gender distribution of the patients

TABLE 1: MEAN AGE IN RELATION TO DISEASE AND GENDER

Variables	Dengue (n=78)	Malaria (n=10)	Both (n=2)
Male (n=)	57	4	2
Female (n=)	21	6	0
Mean age (Years)	30.67	30.60	20.50
IgG (+ ve)	75	0	2
IgM (+ ve)	64	0	1

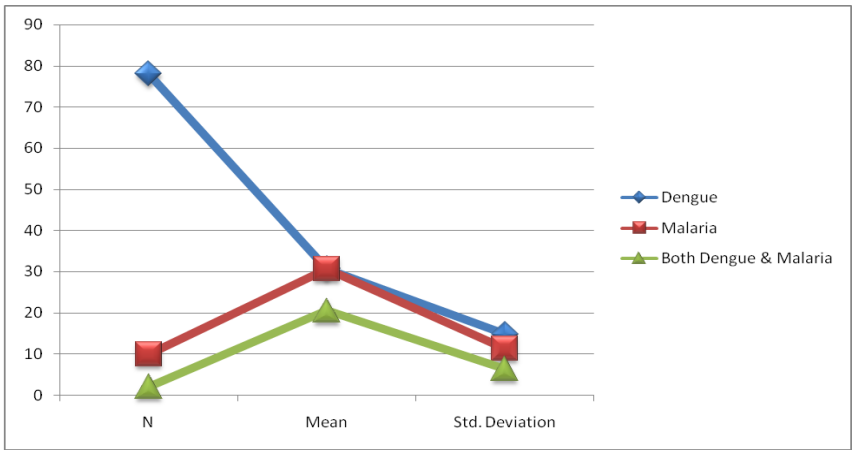

FIGURE 03: Distribution of the patients with dengue, malaria and both in relation to mean ± SD

TABLE 2: MEAN VALUES OF STUDY VARIABLES

TABLE 2						
Variables	**Dengue (n=78)**	**Malaria (n=10)**	**P-value**	**Mean ± SD. Of Difference**	**95% CI of Difference**	**P-value of Non Parametric Test Wilcoxon W**
Hb (g/dl)	12.56 ± 2.6	10.77 ± 2.21	0.040	1.79 ± 0.86	0.086 - 3.50	0.030
PCV (%)	38.6 ± 7.9	33.90 ± 6.72	0.073	4.79 ± 2.64	-0.46 - 10.0	0.058
WBC (CMM)	3.2 ± 0.9	5.59 ± 3.54	0.001	-2.2 ± 0.48	-3.26 - 1.32	0.014
Platelets (CMM)	65.4 ± 39.7	50.10 ± 27.61	0.240	15.36 ± 12.98	10.46 - 41.18	0.296
SGPT (U/L)	120.19 ± 102	58.50 ± 55.70	0.065	61.69 ± 32.99	-3.90 - 127.29	0.002
SGOT(U/L)	164.57 ± 228.9	64.0 ± 64.0	0.172	100.57 ± 73.09	-44.73 - 245.88	0.001
ALP(U/L)	234.85 ± 154.33	214.70 ± 86.01	0.687	20.15 ± 49.93	-79.10 - 119.42	0.937

DISCUSSION

In present study, regarding the dengue group, AST and ALT levels began to increase slightly in the early febrile period: median 50 IU/L for AST levels and 47 IU/L for ALT levels compared with 22 IU/L for AST levels and 30 IU/L for ALT levels at follow-up ($P < 0.001$ for AST and $P = 0.002$ for ALT). Both enzyme levels increased significantly during the critical period to 120 IU/L for AST and 95 IU/L for ALT and reached peak concentrations of 160 IU/L for AST and 150 IU/L for ALT during the convalescent period ($P < 0.01$). The levels returned to normal range at one month follow-up visit in 45% for AST and in 48% for ALT in dengue population. This general pattern of enzymatic disturbance is differs from that usually seen during acute viral hepatitis and is similar to observations in study by Trung DT, et al.[10] It has been observed associations between transaminase levels, increasing severity of vascular leakage and bleeding severity.[11–14] In present study, the acute liver failure found in only a small number of patients, none had severe vascular leakage, although severe bleeding was seen in 15% dengue infected adults and this finding is consistent with former study, in which severe bleeding was frequent and almost associated with dengue shock syndrome.[15] In current study the male gender was predominant in dengue group and it is also consistent with the study by Cook AR, et al.[16] The present series was also observed the liver function profiles among patients with malaria, although previous studies have also documented liver dysfunction in malaria.[17,18] Liver impairment commonly seen in severe P. falciparum malaria and it has been demonstrated that abnormal liver function profile return to normal a few weeks after antimalarial treatment.[19] The observed increase in liver enzymes (AST and ALT) could be due to leakage from hepatic necrosis by the auto immune progress and /or by abnormal cell activation induced by the parasites. Regarding the thrombrocytopenic target population of present study, the mild thrombocytopenia is a common feature of acute malaria regardless of the severity of infection. The profound thrombocytopenia is a well recognized complication of falciparum malaria but less likely observed in vivax infections. In a study conducted by Jadhav et al,[20] only 1.5% of cases of vivax malaria had platelet counts ranging from 5,000 - 20,000/µl without any bleeding manifestations. Makkar et al[21] reported a case of P. vivax presenting with bleeding gums and a platelet count of 8,000/µl. According to former literature, lowest ever platelet count reported in P. vivax was 5,000/µl. In current series, the liver enzymes were deranged in 65 patients of dengue fever and in 7 subjects with malaria infection. The observation of this hepatic enzyme impairment in dengue and malarial infection were also reported by former studies. In present study the dengue serology method by ELISA was used for detecting the dengue infection and malaria parasite (MP) / ICT was used to identify the malaria infection, it is consistent with the study by Moody A and Harani MS, et al.[22,23] Therefore these findings can help us in early awareness for spread of the infection and timely and effective management of fatal but curable diseases (dengue and malaria). Thus, liver enzymes should always be advised in patients presenting with high grade fever and low platelet count and if disturbed should initiate treatment immediately to save the patients acquire various life threatening complications associated with dengue and malaria infection.

CONCLUSION

It was concluded that patients with fever and thrombocytopenia had infected with dengue and malaria. In these patients liver function tests especially SGOT and SGPT (AST and ALT) were altered and deranged in subjects with dengue than malarial population. On the basis of these parameters it was observed that liver function profile is the best tool to assess the severity and spread of the dengue infection and indicates the systemic involvement.

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