



BIOCHEMICAL PROFILE IN PATIENTS WITH MALARIA : AN OBSERVATIONAL STUDY

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ABSTRACT

Background- Malaria is a acute febrile illness being endemic in 104 countries and India contributing to 5% total cases and 4% of mortalities worldwide. Severe malaria is known to affect all the vital organs in the body. This study was conducted to assess the liver and renal impairment in malaria cases.

Methods- This is a retrospective observational study conducted among 104 patients with malaria coming to HSK Hospital and SNMC, Bagalkot during January 2017 to June 2018. Study group included all the patients diagnosed either by smear showing malarial parasite or by rapid diagnostic test for malarial antigen. Patients with chronic liver disease and chronic kidney disease were excluded from the study. Laboratory values like LFT, RFT, RBS and serum electrolytes were collected and analysed. Results were expressed in terms of percentage.

Results- Among the 104 malaria patients, 61 (59%) were males and 43(41%) were females. Age group from 15 to 30 years had highest incidence(47%). 57 patients (55%) had total bilirubin > 1mg/dl, 62 patients (59%) had serum albumin of <3.5mg/dl, 53 patients (51%) had SGOT >40IU/L, 38patients (36%) had SGPT >40 IU/L. 22patients (21%) had blood urea > 40mg/dl, 16 patients (15%) had serum creatinine > 1.2mg/dl. Among 104, 31 patients (29%) had hyponatremia with serum Na <135meq/L, 4 patients (3%) had serum Na >155meq/L. 20 patients (19%) had serum potassium <3.5mEq/L. 9 patients (8%) had random blood glucose of < 70mg/dl.

Conclusion- P.vivax is more common than P.falciparum infection. Liver and renal function derrangement, hypokalemia, hyponatremia are commonly seen in malarial infection.

KEYWORDS : Malaria, Liver function test, renal function test

INTRODUCTION

Malaria is an infectious disease caused by protozoan Plasmodium, spread by female anopheles mosquito.¹ According to WHO annual incidence of malaria is approximately 219 million in 90 countries worldwide, 5% of which are from India.²

There are 5 parasite species causing it, P.Falciparum, P.Vivax, P.Malariae, P.Ovale and P.Knowlesi.¹ In south east Asia P.falciparum is most prevalent (62.8%).²

Clinical features of malaria vary from only fever with chills and headache to altered sensorium, coma and respiratory distress which mainly depends on age, sex, species of parasite, patient's immunity and other co-morbidities present.³

The criteria for severe malaria established by WHO includes cerebral malaria, hypoglycaemia severe anemia, acute kidney injury, jaundice, pulmonary oedema, significant bleeding and shock, resulting in 4 million deaths worldwide in 2017.⁴

METHODS

It is an observational study conducted among 104 the malaria patients coming to HSK hospital, Bagalkot from January, 2017 to June 2018. Data was collected retrospectively through medical record section.

Inclusion criteria- all patients aged more than 14 years with either peripheral smear positive for malaria parasite or positive Rapid Diagnostic Test for malarial antigen (vivax/ falciparum).

Exclusion criteria – Malaria patients with chronic kidney disease, chronic liver disease.

Laboratory values like liver function test, renal function test, random blood sugar and serum electrolytes of malaria patients were collected and analysed. Results are discussed in percentages.

RESULTS

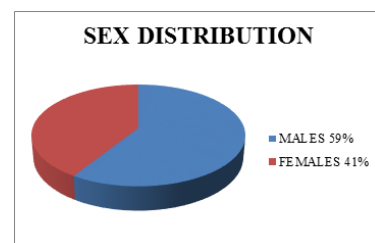
Biochemical lab profile of total 104 patients who were admitted with the diagnosis of malaria were analysed.

Among the 104, 61 (59%) were males and 43(41%) were females (graph 1). Age distribution is shown in table 1. In this study 57 patients were positive for P.vivax malaria, 44 positive for P.falciparum and 3 patients had mixed infection from both the species (graph 2)

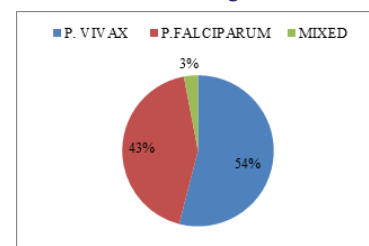
Table -1 Age Distribution Among Patients Of Malaria.

Age	Total	Male	Female
15 to 30 years	49 (47.1%)	29	20
31 to 45 years	15 (14.4%)	7	8
46 to 60 years	21 (20.2%)	15	6
More than 60 years	19 (18.3%)	10	9

Graph 1: Sex Distribution Among Malaria Patients



Graph 2: Species Distribution Among Malaria Patients



LAB PARAMETERS OBSERVED IN THE STUDY-

Among the 104 malaria patients, 57 patients (55%) had total bilirubin > 1mg/dl, 62 patients (59%) had serum albumin of <3.5mg/dl, 53 patients (51%) had SGOT >40IU/L, 38patients (36%)

had SGPT >40 IU/L. 22 patients (21%) had blood urea > 40mg/dl, 16 patients (15%) had serum creatinine > 1.2mg/dl. Among 104, 31 patients (29%) had hyponatremia with serum Na <135meq/L, 4 patients (3%) had serum Na >155meq/L. 20 patients (19%) had serum potassium <3.5mEq/L. 9 patients (8%) had random blood glucose of <70mg/dl.[table 2]

Among 57 P.vivax and 44 P.falciparum cases, 61% of P.vivax had raised total bilirubin and 50% of P.falciparum had raised bilirubin. Hypoalbuminemia was present among 73% of vivax cases where as it is 45% among P.falciparum cases. Raised SGOT is found in 56% of P.vivax patients and 44.6% of P.falciparum patients. Raised SGPT is found in 42% of P.vivax and 21% of P.falciparum cases. ALP was raised in 12% among P.vivax and 6% among P.falciparum patients. Urea and creatinine were raised in 17 and 10% among P.vivax and 27% and 22.7% among cases of P.falciparum respectively. Hypoglycemia was seen in 9% of P.falciparum and 8% of P.vivax cases. Hypokalemia was seen in 17% of P.vivax cases and 22% of P.falciparum cases. Hyponatremia present in 22% of P.vivax and 41% of P.falciparum cases.

Table 2: Biochemical Profile In Patients With Malaria

Lab Parameter	Value	No Of Cases	Percentage
Total bilirubin	≤ 1.0mg/dl	47	45%
	> 1.0mg/dl	57	55%
SGOT	≤40mg/dl	51	51%
	>40mg/dl	53	49%
SGPT	≤40mg/dl	66	64%
	>40mg/dl	38	36%
Serum Albumin	≥3.5mg/dl	42	41
	<3.5mg/dl	62	59%
Alkaline phosphatase	≤140mg/dl	94	90%
	>140mg/dl	10	10%
Hypoglycemia	Yes	9	8%
	No	95	92%
Urea	≤40mg/dl	82	79%
	>40mg/dl	22	21%
Creatinine	≤1.2mg/dl	88	75%
	>1.2mg/dl	16	25%
Sodium	135- 155 mEq/L	73	71%
	<135mEq/L	31	29%
Potassium	≥3.5mEq/L	84	81%
	<3.5mEq/L	20	19%

Table 3: Comparison Of Parameters Derrangements Among P.falciparum And P.vivax.

Parameter	Patients With Derranged Parameters	P.falciparum	P.vivax
Total Bilirubin	57	22(50%)	35(61%)
Hypoalbuminemia	62	40 (73%)	20(45%)
Raised Sgot	53	32(56%)	21(44.6%)
Raised Sgpt	38	24(42%)	14(31%)
Raised Alp	10	7(12)	3(6%)
Urea	22	10(17%)	12(27%)
Creatinine	16	6(10%)	10(22.7%)
Hypoglycaemia	9	5(8%)	4(9%)
Hypokalemia	20	10(17%)	10(22%)
Hyponatremia	31	13(22%)	18(41%)

DISCUSSION-

In our study most common age group affected is between 15 to 30 years (47%) which is comparable to a study conducted by Rajesh deshwal with 51% of patients in age group 21 to 30 years.⁵ In this study percentage of male patients was more 59% compared to females 41% where as Dr. Kalavathi GP et al study had 77.15% males and 22.85% females.⁶ In our study, among 104 patients 57 patients(54%) had P.vivax malaria, 43 patients(41%) had P.falciparum malaria and 3 patients(2%) had mixed infection. This is

comparable to a study by Meti K et al with 50.9% of P.vivax, 35% of P.falciparum and 15% of mixed infection.⁷

In our study, 55 % of patients (n- 57) had raised total bilirubin comparable to Dhariyal et al study where 56% patients had raised total bilirubin.⁸ 53 patients (50.4 %) had raised SGOT and 38 patients (36%) had raised SGPT which is comparable to Dhariyal KK study with 37.75 % patients with raised SGOT and SGPT. In a study by Sarvepalli AK, incidence of raised liver enzymes was 22%. 62 patients (59%) had decreased serum albumin.⁹

In this study 16 patients (15%) had increased serum creatinine comparable to a study conducted by Khuraiya P with raised creatinine and oliguria in 18% of patients.¹⁰ A study conducted by Kalavathi G showed hyponatremia of 30% in P.vivax and 25% in P.falciparum and in comparable to our study with 29% incidence of hyponatremia. In our study, 20 patients(19%) had hypokalemia comparable to study by Kalavathi G with hypokalemia in 15% in P.falciparum and 10% patients of P.Vivax.

When compared among P.vivax and P.falciparum deranged liver function test was more common among P.vivax cases (61%) when compared to P.falciparum(50%). Deranged kidney function was more common among P.falciparum patients(27%) when compared to P.vivax patients(17%). Electrolyte imbalance also was more common among P.falciparum patients compared to P.vivax patients.

CONCLUSION

P.vivax was more common when compared to P.falciparum infection. Young adult with age group 15 to 30 years were most commonly affected. Derranged liver function and renal function is found to be very common among malaria patients which shows the need for strict monitoring of these parameters and appropriate treatment whenever necessary in all the malaria patients.

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