

## Original Research Article

# Clinical profile of malaria and HIV co-infection

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### ABSTRACT

**Background:** Malaria and human immunodeficiency virus (HIV) are two common disease in India. Therefore, authors undertaken this study and compare the incidence clinical feature and outcome of concurrent infection of malaria and HIV infection.

**Methods:** All the patients of fever within 7days duration were investigated for malaria, HIV and other cause of fever. Patients of concurrent HIV and malaria (Group A) were compare with HIV mono-infection (Group-B) and malaria mono-infection (Group C). Biochemical and hematological investigation were done and compared.

**Results:** During the study period 340 patients of malaria were admitted concurrent infection HIV and malaria was found in 52 (15.29%). There were 52 (15.29), 120 (21.7%) and 340 (72.5%) in Group A, B and C respectively. The clinical feature of concurrent infection were more like HIV than malaria. Unlike malaria the outcome of concurrent infection are not good.

**Conclusions:** The study suggested that Malaria and HIV co-infection are uncommon disease. For the diagnosis investigations for both the infections should be carried out routinely.

**Keywords:** CD4 cell, Human immunodeficiency virus, Malaria

### INTRODUCTION

Malaria and human immunodeficiency virus (HIV) are two common disease. The former is parasitic disease transmitted by Anopheles mosquito and the latter is a viral disease cause by retrovirus(HIV) virus, simultaneous occurrence of malaria and HIV cannot be ruled out but study on Malaria and HIV concurrent infection are less number in India and only limited to few case report. It is reported that malaria cause >228million infection in year 2018.<sup>1</sup> There were 37.9 million people were living with (HIV) in year 2018 individually both disease were studied but less number of study in India on concurrent infection were reported.<sup>2</sup> Therefore we undertaken this study to find out the incidence, clinical

feature and outcome of malaria with (HIV).The differences of co-infection with malaria and HIV mono-infection were also study.

### METHODS

This prospective observational study was conducted at Department of Medicine VIMSAR, Burla, Sambalpur Odisha, India, during the period from January 2019 to December 2019 after taking clearance from ethical committee. During the study periods all patient who attended the Medicine Department with history of fever for seven days were included in the study. The detailed clinical history, examination, and laboratory investigation were done in all cases. All the patients were investigated

for malaria and HIV Malaria positive patients were admitted for observation. Patients of malaria were further investigated for HIV to detect malaria and HIV co-infection. The diagnosis of malaria was done by peripheral blood smears (thick and thin) films for malaria parasite were obtained and stained with Giemsa stain and was examination under microscope.<sup>3</sup> These malaria patients were tested for HIV-1 and 2 antibodies by two independent ELISA assays for screening and confirmed by western blot assay as per the NACO guide line 2018.<sup>4</sup> We collected blood sample for complete blood count (CBC), Fasting blood glucose, blood urea, serum creatinine, serum sodium, potassium, bilirubin, serum glutamate oxaloacetate transaminase (SGOT) serum glutamate pyruvate transaminase (SGPT) alkaline phosphatase (ALP) and to assess the status of HIV patient CD4 cell count were done. Patients of malaria and HIV co-infection were considered as severe infection and treated with Inj. Artesunate and Anti-retroviral therapy (ART drug) as per WHO and NACO guideline supportive fluid therapy and treatment with antibiotic was administered as per requirement, selection of patient.<sup>4,5</sup>

#### Inclusion criteria

- Patient with clinical feature of malaria.
- Patient with clinical feature of HIV.
- Age of patient >14 years

#### Exclusion criteria

- Age of patient <14 years.
- Patients with history of PUO, UTI, PTB and Hepatitis.

## RESULTS

During the study period 340 patients were enrolled, out of 340 patients malaria was positive in 102 patient concurrent infection of HIV and Malaria were 52 patient. Hence there were 52 (15.29%), 102 (30%) and 340(100%) in group A B and C respectively. The prevalence and clinical feature of Group A were analyses with respect to sex, age, fever, vomiting, headache, aspiration pneumonia, jaundice, AKI, convulsion, weight loss, confusion, loose stool, hypotension and anemia which were comparable with clinical feature of Group B (Table 1).

This study showed that prevalence in respect to age, sex shown in (Table 1) out of the 52 patient of (Group A) 38 (73.07%) were males and 14 (26.92%) were female, between the age group of (31-40) years was recorded with highest percentage of co-infection infection in 32 (61.53%) patients compare with (Group B) it was 68 (66.6%) in male and 34 (33.3%) were female, age group of (21-30) years were highest with 51 (50%) in malaria infection. Clinical feature of malaria with HIV co-infection were analysis and compare with both group (A and B). Among 52 patients in (Group A) shown in (Table 1) fever was presenting symptom in highest number of patients 52 (100) followed by vomiting was present in 34 (72.30) of patients and Anemia in 34 (72.30), headache in 30 (65.38) respectively, aspiration pneumonia in 24 (57.69), AKI in 18 (30.76) and jaundice in 16 (48.07) of patients where as in (Group B) mostly presented with fever in 102 (100) of patient vomiting was present in 52 (53.05) of patients, anemia in 43 (42.15), headache in 32 (31.37), aspiration pneumonia in 35 (34.3), AKI in 17 (16.6) and jaundice in 20 (9.60) of patients

**Table 1: Clinical presentation.**

Feature	HIV Malaria co-infection	Malaria	Total
No. of subject	52	102	340
Sex	Male	38 (73.07)	220 (64.7)
	Female	14 (26.92)	120 (35.2)
Age group	(21-30)year	9 (17.30)	163 (48)
	(31-40)year	32 (61.53)	95 (28)
	(41-50)year	11 (21.15)	81 (24)
Clinical Symptom	Fever	43 (82.69%)	340 (100)
	Vomiting	34 (72.30%)	268 (78.9)
	Headache	30 (65.38%)	204 (60.0)
	Convulsion	14 (26.92%)	67 (19.7)
	Weight loss	12 (23.7%)	34 (10.0)
	Confusion	06 (11.53%)	24 (7.05)
	Loose stool	08 (15.38%)	28 (8.2)
Clinical sign	Aspiration pneumonia	24 (57.69)	270 (79.4)
	Jaundice	16 (30.76)	140 (41.2)
	AKI	18 (34.6)	52 (15.2)
	Hypotension	12 (23.07%)	38 (11.1)
	Pallor (Anemia)	34 (72.30%)	139 (40.88)

**Table 2: Laboratory parameter.**

Laboratory parameter	HIV-Malaria Co-infection (n-52)	Malaria (n-102)	Total (n-340)
Hemoglobin (<7gm/dl)	43 (82.69)	63 (61.76)	160 (47.05)
TLC (>8000/cumm)	16 (30.76)	34 (33.33)	122 (35.88)
Blood sugar (>126mg/dl)	12 (23.07)	17 (16.66)	72 (21.17)
Renal function test	Blood urea (>20gm/dl)	14 (26.92)	75 (22.05)
	Serum creatinine (>2mg/dl)	10 (19.23)	57 (16.76)
Liver function test	Serum bilirubin(>2mg/dl)	12 (23.07)	61 (17.94)
	SGOT (IU/l)	6 (11.53)	16 (4.70)
	SGPT(IU/l)	7 (13.46)	19 (5.58)
	ALP(IU/l)	5 (9.61)	15 (4.41)
MP smear (thick and thin)	18 (34.61)	48 (47.05)	48 (14.11)
MP (QBC)	34 (65.38)	54 (52.94)	54 (15.88)
Serum Na (mEq/l)	17 (32.69)	35 (34.31)	52 (15.29)
Serum K (mEq/l)	13 (25)	27 (26.46)	40 (11.76)
HIV screening	18 (34.61)	18 (17.64)	18 (5.29)
HIV confirmatory	34 (65.38)	34 (33.33)	34 (10)
CD4 cell (<200/micro lit.)	42 (80.76)	42 (41.17)	42 (12.35)
CD4 cell (<200/micro lit.)	10 (19.23)	10 (9.80)	10 (2.94)

Among 52 patients of (Group A) on laboratory evaluation shown in (Table 2) most common laboratory finding were hemoglobin (<7gm/dl) in 43 (82.69) patients. CD4 cell count<200/micro lit. in 42 (80.76) patient, TLC Count >8000/Cumm in 16 (30.76) number of patients. Serum creatinine >2mg/dl in 10 (19.23) of patients, serum Bilirubin in 12 (23.03), SGOT in 6 (11.53), SGPT in 7 (13.46), ALP in 5 (9.61), MP Smear (+ve) in 18 (34.61), Serum Sodium in 17 (32.69), Serum Potassium in 13 (25) compare with (Group B) of 102 patients anemia in 63 (61.76), TLC count was>8000/cumm in 34 (33.33) of patient, serum creatinine>2mg/dl in 12 (11.76), serum Bilirubin in >2mg/dl in 16 (15.68), SGOT in 10 (9.68), SGPT in 11 (10.76), ALP in 9 (8.82), serum Sodium in 35 (34.31) serum Potassium in 27 (26.46) compare with (Group B). All the patients were treated with Injection Artesunate, antibiotic, antiretroviral drug blood transfusion in anemic patients and IV fluid as per requirement.<sup>4,5</sup>

## DISCUSSION

The present study shown in (Table 1) the prevalence of malaria in (Group A) were most of the patients were in the age group of (31-40) years were 32 (61.53) patient followed by age group of (41-50) years were 11 patients (21.15) out of 52 patients male were 38 (73.07%) and female were 14 (26.92%). This is compare to the study in which male were (40.8%) and female were (59.2%).<sup>6</sup> Another study show male (25%) and female (37.96%) in this age group in which female were more in compare to male.<sup>7</sup> In another study shown 73% of patient with HIV are male which is similar to this study compare with (Group B).<sup>8</sup>

This could be as a result of this age group of people were more active they were stay outside the home for job. Majority of the patients in (Group A) presenting symptom were fever 43 (82.69%) followed by vomiting 34 (72.30%), and anemia in 34 (72.34) patients. Headache in 30 (65.38%), aspiration pneumonia in 24 (57.69%), confusion in (23.07%), jaundice in 16 (48.07%), pallor (anemia) in 34 (72.34%), AKI in 18 (30.76%), weight loss in 12 (26%), loose stool in 8 (11.53%), hypotension in 12 (13.46%), which is compare to study in which fever in (75%), vomiting in (44%), headache in (91%), pulmonary edema in (4%), confusion in (26%), jaundice in (9%).<sup>9</sup>

Another study shown anemia in (60%) and renal impairment in (6.7%), hypoglycemia in (13.3%), circulatory collapse in (6.7%), study shown (50%) had weight loss, (65%) had diarrhea and (47%) had fever.<sup>6,10</sup> Majority of patient were presented with more than one symptom like fever, vomiting, headache but common presentation is fever compare with (Group B) fever was present in 102 (100) of patients followed by vomiting in 52 (53.05) and anemia in 43 (42.15) of patients.

Laboratory parameter in (Group A) shown in (Table 2) hemoglobin was (<7gm/dl) in 43 (82.69%) patients, blood glucose <126mg/dl in 12 (23.07%) patients, serum creatinine more than 2mg/dl in 10 (19.26%) patients, serum bilirubin >2mg/dl in 7 (13.46%) patients, TLC count,<8000/cumm in 16 (30.76%) of patients, CD4 cell count <200 cell/mm<sup>3</sup> in 42 (80.76%) patients this is compare with study in which hemoglobin <11g/dl (25.8%) and hemoglobin >11 (74%) of patients majority with malaria infection (89.4%) had mild to moderate

anemia with only (4.3%) have severe anemia in study.<sup>7,11</sup> In the present study CD4 cell count <200cell/mm<sup>3</sup> (80.76) and CD4 Cell >200cell/mm<sup>3</sup> in (19.23) in Group A and CD4 cell<200 in (41.17) and CD4 cell>200 in (9.80) number of patients which is compare with study Severe malaria was more in patient with a CD4+ T cell count <200x10 cell/l (p,.001) compared with HIV-infected patient another study shown individual who had CD4+ lymphocyte count of <350Cell/mm<sup>3</sup> were 2.3 times more likely to be co-infected than individuals who had CD4+ lymphocyte count of <350Cell/mm<sup>3</sup>, CD4+ lymphocyte count was significantly associated with co-infection.<sup>12,13</sup>

Most of the patients were treated with Inj Artesunate 2.4 mg/kg/BW at 1st dose at (0) hour, 2.4 mg/kg/BW 2nd dose at (12) hour and dose, 2.4mg/kg/BW at (24) hour 3rd dose 2.4mg/kg/BW, OD for 2 to 7 days.<sup>5</sup> All the patients were treated with Antiretroviral drug (ART), ZLN regimen and change to TLE regimen in 43 patients due to anemia.<sup>4</sup>

Out of 52, 48 patients were recovered and 6 patients were died. This compare with study shown 1 and 3 number of patients died.<sup>13,14</sup>

## CONCLUSION

Malaria and HIV co infection are commonly seen in tertiary care hospital, the age group of (36-40) year most commonly and male were affected more in compare to female, fever was common presentation, anemia, decrease CD4 cell count were common lab parameter, out of 52 patients 48 patients responded to treatment and 4 patients are died. Outcome is not good (poor) in this study may be due to comorbidity like aspiration pneumonia, anemia and AKI are the common causes.

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