DOI: 10.14260/jemds/2014/1868

ORIGINAL ARTICLE

A STUDY OF CLINICAL PROFILE IN PATIENTS WITH P.VIVAX MALARIA

S. Apte[1], J. Jain[2], A. Parmar[3], A. Apte[4], U. Sinha[5], R. Chanchlani[6]

HOW TO CITE THIS ARTICLE:
S. Apte, J. Jain, A. Parmar, A. Apte, U. Sinha, R. Chanchlani. "A Study of Clinical Profile in Patients with P.Vivax Malaria". Journal of Evolution of Medical and Dental Sciences 2014; Vol. 3, Issue 03, January 20; Page: 575-581, DOI: 10.14260/JEMDS/2014/1868

ABSTRACT: BACKGROUND: After P. falciparum, P.vivax is the most significant malaria species, often both may coexist. Clinical features include fever, chills, sweating, headache, diarrhoea, abdominal pain, distension, cough, hepatomegaly and splenomegaly. Large studies from Islands of New guinea now show a strong association between P. vivax infection and severe disease and even death. **MATERIAL AND METHODS:** This was a cross sectional study, carried out in the department of Medicine, Surat Municipal Institute of Medical Education & Research during the period of June 2009 to August 2010. Patients of age 18 years or above fitting in the case definition of malaria with positive peripheral smear for P.vivax were included in the study. The details of the patients along with their clinical features, routine hematological and biochemical investigations were recorded in a standard proforma. The diagnosis of P.vivax was made from thick smear examination and if positive it was further confirmed by examining a thin smear slide. **RESULTS:** Most common clinical presentation was fever which was high grade, intermittent along with chills seen in 99% of patients. Bodyache, headache was observed in 65% & 61% respectively. Out of 140 patients 46(32%) had Hb >12gm% and 5(4%) had Hb <5gm%. 119(85%) had thrombocytopenia and 21(15%) had normal platelet count, only 6(4%) had severe thrombocytopenia. Out of 140 patients 55(39%) had +1 parasitemia, 36(26%) had +2 parasitemia, 31(22%) had +3 parasitemia and 18(13%) had +4 parasitemia. **CONCLUSION:** This study concludes that severe complications which were earlier known to occur with falciparum malaria are also observed with P. vivax infection. It is important to reevaluate the clinical presentation of P.vivax malaria keeping in mind the frequency and severity of complications observed in our study. Close monitoring of all P.vivax patients to avoid various complications which will lessen the burden on limited resources.

KEY WORDS: Malaria, Parasitemia, P.vivax, Thrombocytopenia.

INTRODUCTION: Malaria is the most important parasitic disease of man, killing between 1-3 million people every year globally.[1] After P. Falciparum, P.vivax is the most significant malaria species, often both may coexist.[2] Clinical features include fever, chills, sweating, headache, diarrhoea abdominal pain and distension, cough, hepatomegaly and spleenomegaly.[3-5] It was believed that most deaths occur because of P. falciparum infection.[6] Large studies from Islands of New guinea now show a strong association between P. vivax infection and severe disease and even death.[7-9] It is even stated that P. vivax is the most common of four malaria species.[10] Another study show that 21-27% of patients with severe malaria have P. vivax monoinfection.[11] The objective of the present study was to determine the detailed clinical profile, clinical manifestations laboratory parameters and various complications in patients coming to our institution with acute malaria caused by P.vivax.

MATERIAL AND METHODS: This was a cross sectional study, carried out in the department of Medicine, Surat Municipal Institute of Medical Education & Research during the period of June 2009

DOI: 10.14260/jemds/2014/1868

to August 2010. Patients of age 18 years or above fitting in the case definition of malaria with positive peripheral smear for P.vivax were included in the study.[12, 13] These patients were admitted in the medicine wards. The details of the patients along with their clinical features, routine hematological and biochemical investigations were recorded in a standard proforma. Total number of patients included was 140 and informed consent was taken from each. The patients with mixed parasitemia, or those with existing co-morbidity like DM, HTN and those who had already received antimalarials were excluded from the study. The diagnosis of P.vivax was made from thick smear examination and if positive it was further confirmed by examining a thin smear slide. Patients were further investigated if they fit the category of severe and complicated malaria as per WHO criteria.[14, 15]

RESULTS: Out of 140 patients, 80(57%) were males and 60(43%) were females. 68% of the patients were between 18-40 years of age, mean age was 35±13.38. Most common clinical presentation was fever which was high grade, intermittent along with chills seen in 99% of patients. Bodyache and headache was observed in 65% & 61% respectively. Details of clinical symptoms are given in Table no. 1. At the time of admission, 46% of the patients had duration of fever between 5 to 8 days. Only 6% of the patients had fever more than 8 days. 39% of the patients had duration of fever between 3-5 days while 9% of the patients had fever for less than 3 days. Most common sign in patients of P. vivax malaria was fever seen in 92(66%) while a rare sign like hypotension was observed in 6(4%) patients (Table no. 2). Out of 140, 92(66%) patients had temperature more than 100^{o}F while the rest had temperature less than 100^{o}F, The mean temperature observed for all patients was 100.2^{o}F(SD=1.5). In our study 82(59%) patients had pulse more than 100/minute at the time of admission while in 58(41%) patients, the pulse rate was less than 100/minute. Out of our 140 patients 46(32%) had Hb >12gm%, 42(30%) had Hb between 10-12gm%, 33(24%) had Hb between 8-10gm%, 14(10%) had Hb between 5-8gm% and 5(4%) had Hb <5gm%. Out of 140 patients, 119(85%) had thrombocytopenia and 21(15%) had normal platelet count, only 6(4%) had severe thrombocytopenia. 30(21%) patients in our study had leucopoenia, 15(11%) had leukocytosis and 95(68%) had normal count. Out of 140 patients 55(39%) had +1 parasitemia, 36(26%) had +2 parasitemia, 31(22%) had +3 parasitemia and 18(13%) had +4 parasitemia. Out of 140 patients, 112(80%) had S.creatinine <1.5mg%, 14(10%) had S. creatinine between 1.5-3mg% and 14(10%) had S.creatinine >3mg%. Out of 140 patients, 38% had S. bilirubin between 1-3mg% and 25% had S.bilirubin > 3mg%. 15% of our patients had SGPT levels > 120 IU/L. Various complications seen in our as well as other studies are enumerated in (Table no.3)**.** Significant reverse association was seen between degree of parasitemia and decrease in platelet count. 7 of the 140 patients in our study had bleeding in form of petechiae or hematuria and all of them had platelet count, <40000/ cumm.

DISCUSSION: The most common symptom in our study was fever 99%, followed by bodyache 65%. A comparative table of various common symptoms observed in different studies is given in Table no. 4. All studies have a common feature of Fever. Majority of studies observed that headache was a frequent complaint except the Uttarakhand study in which headache was observed in only 11.4% of the patients, also otherwise a common symptom of nausea and vomiting was reported in only 12.1%.[20] Pain in abdomen and diarrhoea was unusually low 6% & 2% respectively in Pakistan study.[17] We observed 54% patients with splenomegaly and 43% with hepatomegaly, while Pakistan

study shows splenomegaly in 59% and hepatomegaly in only 4%.[17] We observed that all the studies from Indian subcontinent show high percentage of splenomegaly as compared to other international studies, this might be due to most of the subjects in this region are from malaria endemic area.[5, 16, 17, 23.]As compared to others hepatomegaly was observed in quite a high percentage of patients in our study. Mean Hb and platelet count were lower while S. creatinine, S. bilirubin and SGPT were higher in our study as compared to Colombia study, this might due to selection bias as we included indoor patients only. In the present study in spite of hepatomegaly observed the degree of hepatic injury was not severe and marker of liver dysfunctions like S.bilirubin and Prothrombin time were not very high. Thrombocytopenia which was seen in 85% of our patients was similar to Ali Hussain et.al.[21] Kashikunti et.al. Observed thrombocytopenia being the most common finding in P.vivax malaria.[19] 6 of our patients had severe thrombocytopenia (platelet count <50000) had bleeding like epistaxis or hematuria but we had no fatality due to this complication.

In our study out of 140, 83(59%) patients had evidence of P.vivax infection with severe manifestations (complicated malaria) as per WHO criteria. The incidence and number of various complications in our study as well as those in other studies is shown in Table no. 3. Most common complication was thrombocytopenia followed by hepatic dysfunctions. Renal failure was next which was observed to be second commonest by Kochar et.al.[22] and others. [26, 27] All of our patients with renal dysfunction recovered with fluid therapy except one who required dialysis. Other complications reported in various studies include cerebral malaria.[24] Severe anaemia.[25] ARDS and multiple organ involvement. Evidence of sequestration of parasite in lung vasculature during evaluation of lung injury in P.vivax malaria was reported.[28]Cerebral dysfunction in P. vivax was postulated due to generation of nitric oxide.[24]Cytokines and leukotrienes may be responsible for severe anemia and hemostatic complications.[29] Recent research that analyzed severity of P.vivax infection clearly demonstrated enhanced aggregation, erythrocyte clumping and reduced deformability affecting microcirculation.[30]

CONCLUSION: This study concludes that severe complications which were earlier known to occur with falciparum malaria are also observed with P. vivax infection. If one considers the re-emergence of P.vivax malaria in several areas our study indicates the necessity to further examine the different issues related to P.vivax infection. It is obvious to reevaluate the clinical presentation of P.vivax malaria keeping in mind the frequency and severity of complications observed in our study. Close monitoring of all P.vivax patients to avoid various complications which will lessen the burden on limited resources. Further study is required to pinpoint the exact pathogenesis of the organ specific complications in P.vivax malaria.

REFERENCES:

1. Roll Back Malaria, World Health Organization and United Nations Children's Fund (UNICEF). World Malaria Report 2005. (Online). Available from URL: http//rbm.who.int/wmr.
2. Mendis K, Sina BJ, Marchesini P, Carter R. The neglected burden of Plasmodium vivax malaria. Am. J Trop Med Hyg 2001; 64:97-106.
3. Malik GM, Seidi O, El-Taher A, Mohammed AS. Clinical aspects of malaria in the Asir region, Saudi Arabia. Ann Saudi Med 1998; 18: 15-17.

4. Hozabari S, , Akhtar S, Rahbar M, Luby S. Prevalence of plasmodium slide positive among children treated for malaria. Jhangara, Sindh. J Pak Med Assoc 2000; 50: 401-5.
5. Sheikh AS, Sheikh AA, Sheikh NS, Paracha SM. Endemicity of malaria in Quetta Pakistan J Med Res 2005;44:41-5.
6. Greenwood BM, Bojang K, Whitty CJ et.al. Malaria Lancet 2005; 365:1047
7. Barcus MJ, et.al. Demographic risk factors for severe and fatal vivax and falciparum malaria among hospital admissions in north-eastern Indonesian Papua. Am. J Trop. Med Hyg 2007; 77:984-91.
8. Tjitra E, et.al. Multidrug resistance plasmodium vivax associated with severe and fatal malaria: a prospective study in Papua, Indonesia PloS med 2008; 5:e128.
9. Genton B.et.al. Plasmodium vivax and mixed infections are associated with severe malaria in children: a prospective cohort study from Papua New Guinea. PLoS Med 2008; 5:e127.
10. Li j et.al. Geographic subdivision of the range of the malaria parasite, plasmodium vivax. Emerging infectious diseases, centre of disease control and prevention, Vol.7 no.1 Jan-Feb 2001.
11. Price RN Douglas NM, Anstey NM. New development in Plasmodium vivax malaria: severe disease and the rise of Chiloquin resistance. Current Opin Infect Dis.2009 cot; 22(5):430-5.
12. IDSP, Case definition, Chapter 2, 1-14
13. WHO Recommended Surveillance standards; Second edition 1999
14. Harrison's Principal of Internal Medicine; Part 7;section 18; Protozoal Infection Malaria;17th edition, Vol. 1.McGraw Hill Publishers1280-94.
15. Guidelines for the diagnosis and treatment of malaria: National Institute of Malaria Research, Delhi 2009.
16. Marcela Echeverri, Alberto Tobon, Gonzalo Alvarez, Jaime Carmona, Silvia Blair. Clinical and Laboratory findings of Plasmodium vivax Malaria in Colombia, 2001; Rev.Inst. trop. S.Paulo. 45(1); 29-34, Jan-Feb, 2003.
17. Abdul Rasheed, Shahzad Saeed, Saleem Ahmed Khan, Journal of Pakistan Medical association, Clinical and laboratory findings in acute malaria caused by various plasmodium species. 59; 220; 2009.
18. Myoung-Don Oh, Hyungshik Shin, Donghhyun Shin, Uiseok Kim, Sunhee Lee, Namjoong Kim, Min-Ho Choi, Jong-Yil Chai, Kangwon Choe, Clinical features of vivax malaria, Am. J. Trop. Med.Hyg.65(2), 2001, 143-46.
19. Kashikunti MD, Gundikeri SK, Dhananjay M, clinical profile of severe Plasmodium vivax Malaria in a tertiary care centre of North Karnataka. International Journal of scientific and research Publication, Vol.3.issue7, July2013.
20. S.P.Singh, Ragini Singh, Niaz Ahmad, complications of vivax malaria in uttarakhand, india, International journal of Research in Medical Science, 2013 Nov;1(4); 532-35.
21. Ali Hassan Abro, Ahmed Alhaj Saleh, Ahmed Saleh Abdou, Abdulla Mohd. Ustadi, Hassan MH Shuri, Rania M Seliem; thrombocytopenia in adults with acute malaria. Rawal Medical Journal; Vol34, no.2July-Dec 2009.
22. Dhanpat K. Kochar, Ashish Das, Sanjay K Kochar, Vishal Saxena, Parmendra Sirohi, Shilpi Garg, Abhishek Kochar, Mahesh P Khatri, Vikas Gupta. Severe plasmodium vivax malaria: Report on

serial cases from Bikaner in north western India: The American Society of tropical medicine and hygiene, 80(2), 2009; 194-198.

23. Tangpukdee N, Thanachartwet V, Krudsood S, Luplertlop N, Pornpininworakij K, Chalermrut K et al. Minor liver profile dysfunctions in Plasmodium vivax, P.malariae and P.ovale patients and normalization after treatment. Korean Journal of Parasitology 2006; 4: 295-302.
24. Beg MA, Khan R, Baig SM, Gulzar Z, Hussain R, Smego RA. Cerebral Involvement in benign tertian malaria. Am J Trop Med Hyg 2002; 67:230–32.
25. Dondorp AM, Lee SJ, Faiz MA, et al. The Relationship between Age and The Manifestations of and Mortality Associated with Severe Malaria; Oxford Journals, Medicine, Clinical Infectious Diseases 2006; 47:151-57
26. Mohapatra MK, Padhiary KN, Mishra DP, Sethy G, 2002. Atypical manifestations of Plasmodium vivax malaria. Indian J Malariol 39: 18–25
27. Mehta KS, Halankar AR, Makwana PD, Torane PP, Shah VB, 2001. Severe acute renal failure in malaria. J Postgrad Med 47: 24–26.
28. Nicholas MA, Handojo T, Michael CF, Tjitra E, Price RN, Graeme PM, 2007. Lung injury in vivax malaria: pathological evidence for pulmonary vascular sequestration and post treatment alveolar inflammation. JID 195:589–596.
29. Clark IA, Cowden WB, 1999. Why is the pathology of falciparum worse than that of vivax malaria? Parasitol Today 15: 458–461.
30. Jayavanth S, Park BC, 2007. Microrheologic dysfunctions in blood during malaria. Indian J Exp Biol 45: 111–120.

Symptoms	No. Of cases	Percentage
Fever	139	99%
Body ache	91	65%
Headache	85	61%
Nausea & vomiting	77	55%
Myalgia	66	47%
Abdominal pain	58	41%
Yellow urine & sclera	39	28%
Diarrhoea	27	19%
Decreased urine output	16	11%
Breathlessness	11	8%
Altered consciousness	10	7%
Convulsions	08	6%
Bleeding	07	5%

Table no. 1: Symptoms of P. vivax malaria patients

DOI: 10.14260/jemds/2014/1868

Signs	No. Of cases	Percentage
Fever	92	(66%)
Tachycardia	82	(58%)
Splenomegaly	75	(54%)
Hepatomegaly	60	(43%)
Icterus	44	(31%)
Pallor	22	(16%)
Tachypnea	19	(14%)
Systemic bleeding	07	(05%)
Hypotension	06	(04%)

Table no. 2: Signs in P.vivax Malaria Patients

Complications	Present study (n=83)	Bikaner Study[22] (n=40)	Uttarakhand study[20] (n=63)	Karnataka study[19] (n=50)
Thrombocytopenia	68%	22.5%	38.5%	48%
Hepatic dysfunction	40%	57.5%	-	42%
Acute Renal Failure	17%	45%	6.4%	46%
ARDS	12%	10%	2.1%	04%
Convulsions	10%	-	-	06%
Systemic bleeding	09%	05%	-	-
Hypotension	07%	07.5%	9.3%	-
Anemia (< 5 gm. %)	06%	32.5%	7.9%	-
Hypoglycemia	05%	02.5%	-	-
Cerebral Malaria	04%	12%	19.3%	16%
Multi organ failure	58%	47.5%	-	16%

Table no. 3: Comparison of complications of P. vivax malaria in various studies

DOI: 10.14260/jemds/2014/1868

Symptoms	Present Study (n-140)	Colombia Study [16] (n-104)	Pakistan Study[19] (n-100)	Korean Study [20] (n-101)	Karnataka Study[21] (n-50)	Uttarakhand study[22] (n-140)
Fever	99%	99%	97%	100%	98%	100%
Body ache	65%	58%	-	42.6%	-	-
Headache	61%	99%	58%	83.2%	50%	11.4%
Nausea & vomiting	61%	39%	48%	23.8% & 16.8%	72%	12.1%
Pain in abdomen	41%	34%	6%	-	20%	13.6%
Jaundice	28%	-	-	-	40%	12.1%
Diarrhea	19%	13%	2%	23.8%	-	7.9%
Signs on examination						
Fever>100	66%	35%	-	-	-	-
Pallor	16%	46%	-	-	36%	42.9%
Icterus	31%	15%	-	-	42%	-
Spleno-Megaly	54%	10%	59%	42%	-	26.4%
Hepatomegaly	43%	17%	4%	15.8%	-	15.7%

Table no. 4: Comparison of Clinical symptoms and signs of P. vivax malaria in various studies

AUTHORS:

1. S. Apte
2. J. Jain
3. A. Parmar
4. A. Apte
5. U. Sinha
6. R. Chanchlani

PARTICULARS OF CONTRIBUTORS:

1. Associate Professor, Department of Medicine, Chirayu Medical College and Hospital, Bhopal.
2. Associate Professor, Department of Medicine, Chirayu Medical College and Hospital, Bhopal.
3. Consultant Physician, Department of General Medicine, Lotus Hospital, Valsad.
4. Occupational Health Physician, Department of General Medicine, Procter and Gamble, Bhopal.
5. Associate Professor, Department of Community Medicine, Chirayu Medical College and Hospital, Bhopal.
6. Associate Professor, Department of Surgery, Chirayu Medical College and Hospital, Bhopal.

NAME ADDRESS EMAIL ID OF THE CORRESPONDING AUTHOR:

Dr. S. Apte
C/O. Dr. Roshan Chanchlani,
1/6 – Idgah Kothi, Doctors Enclave,
Near Filter Plant, Idgah Hills,
Bhopal, (M.P) – 462001..
Email – roshanchanchlani@gmail.com

Date of Submission: 28/12/2013.
Date of Peer Review: 30/12/2013.
Date of Acceptance: 07/01/2014.
Date of Publishing: 14/01/2014.