ORIGINAL ARTICLE

Prevalence of Malaria at District Shaheed Benazirabad

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ABSTRACT

Objective: To evaluate the frequency of Malaria on the basis of two common species of malarial parasite at district (SBA) Shaheed Benazirabad.

Study Design: Descriptive and experimental study.

Place & Duration of study: This study was conducted at Diagnostic & research laboratory in Pathology Department of Peoples University of Medical & Health Sciences Nawabshah, at (SBA) from April 2015 to September 2015.

Material & Methods: Total 300 patients including 197 males, 103 females at their ages ranged between 3 and 71 years were selected. History of fever with or without associated symptoms and clinical examination including anemia as well as splenomegaly were noted and all the blood samples were sent to the laboratory for complete blood analysis, examination of peripheral blood smears and immunochromatography test (ICT) to identify common species of malarial parasites. Data were analyzed by using statistical package for social sciences (SPSS) version 17.0.

Results: The mean age of total patients was 37±34 years and male to female ratio was 1.9:1. The frequency of P. vivax was founded in 230 (76.6%)patients and P. falciparum in 70 (23.4%) patients by direct microscopy of stained thick and thin peripheral blood smears. ICT Malaria test was positive in 103 (34.3%) patients with P.vivax malaria infection while this test was positive in 10 (3.3%) of cases with p. falciparum malaria infection and ICT malaria is negative in 187 (62.4%) cases out of total 300 patients with malaria.

Conclusion: The frequency of P vivax malaria is more common than the falciparum malaria needed early diagnosis, prevention and urgent treatment to reduce mortality rate due to severe complications.

Keywords: Frequency, Malarial parasites, malaria, immunochromatograthy test(ICT)

INTRODUCTION:

Malaria is a protozoal infection caused by five species of Plasmodium in humans, P. falciparum,P. vivax, P. ovale, P. malariae and P. knowlesi of these first two species are common in Pakistan but recently plasmodium knowlesi causes malaria in the south east Asia and Malaysia[1]. Plasmodium is transmitted through the bite of infected female Anopheles mosquito but can be transmitted by blood transfusion, bone marrow transplantation and transplacentally[2]. Malaria is a disease that present with broad spectrum of clinical features such as fever with rigors, chlills sweating, headache, bodyache, joint and abdominal pain, bitter mouth, nausea, vomiting, dry cough, weakness, anemia, jaundice, spleenohepatomegally.[3] The hematological changes associated with Malaria include low hemoglobin, leucopenia, leukocytosis and thrombocytopenia caused by increased destruction of infected and non-infected RBC, WBC and Platelet by reticuloendothelial system, depression of erythropoiesis in bone marrow, sequestration of blood cells in spleen due to spleenomegally.[4] The laboratory findings are reduced hemoglobin g/dl,raisedESR per one hour, neutrophilic leukocytosis, normal or decreased platelet count and on examination of thick and thin blood smears, malarial parasites can be detected.[5] The malaria rapid diagnostic test is used to detect the different types of antigen of malaria parasites in the blood.[6] Only P.knowlesi can be detected by

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nested polymerase chain reaction (PCR) and other Plasmodium species such as P. vivax, P. falciparum, Plasmodium ovale ,Plasmodium malariae can be detected by this method.[7] This study was designed to evaluate the frequency of common types of malaria in our district area.

MATERIAL AND METHODS:

This Descriptive and experimental study was conducted at Diagnostic & research laboratory in Pathology Department of Peoples University of Medical & Health Sciences Nawabshah, at (SBA) from April 2015 to September 2015.

Total 300 patients including 197 males,103 females at their ages ranged between 3 and 71 years were selected. History of fever with or without associated symptoms and clinical examination including anemia as well as splenomegaly were noted. 5 ml of venous blood was drawn from anticubital vein in EDTA containing bottles from each patient for analysis of Complete blood counts by Nihon Khoden automated hematology analyzer. Blood samples were used for preparing thin and thick blood smears that were stained with Field's stain and slides were examined fortrophozoites and gametocytes of malarial parasite. At least 200 fields on oil immersion lens were examined before declaring a slide negative for malarial parasite. The immunochromatography test (ICT) was performed from each patient as fallows: 10μl of whole blood was added to sample pad containing colloidal gold labeled antibodies followed by buffered reagent to induced cell lysis. The released HRP2 and pan malarial antigen bounded to antibody on the pad and antigen labeled antibody complex migrate up the test strip where It crosses two test line and one control line. If HRP2 line visible then it indicate p.falciparum infection, if only pan malarial antigen line is visible then it indicates mixed malarial parasite infections except p.falciparum infection, if only control line is visible then it indicated ICT malarial test negative. Following patients were excluded from this study:patients present with non malarial infection, patients already taking anti malarial drugs and pregnant women suffering from malaria. Data were analyzed by using statistical package for social sciences (SPSS) version 17.0.

RESULTS:

A total of 300 febrile patients were evaluated in this study. The mean age of these patients was 37±34 with male to female ratio of 1.9:1. These patients were suffering from fever with rigor, sweating, headache, body ache 230 (76.6%) palpitation 70(23.4%), mild anemia 210(70%), moderate to severe anemia 90(30%) and splenomegaly 45(15%). Mean value of hemoglobin g/dl,total leucocyte count/cmm and platelet count/cmm were 9.5±2.5, 15500±10500, 170000±130000 respectively. The neutrophilic and eosinophilic leucocytosis were 80±5% and 10±2% respectively while mean value of percentage of lymphocyte was 15±4% and on the basis of microscopy of thick and thin peripheral blood smears, the frequency of P vivax was 230(76.6%)and P. falciparum was 70(23.4%) among the patients with malaria. The ICT Malaria test was positive in 103 (34.3%) patients with P.vivax malaria infection while this test was positive in 10 (3.3%) of cases with P.falciparum malaria infection and ICT malaria is negative in 187 (62.4%) cases out of total 300 patients with malaria.

Table-1: Shows Baseline Data in Patients of Malaria (N=300)

Parameters	Findings
Age 37± 34	Male=197,Female=103 M:F Ratio=1.9:1
Clinical Findings	
Fever without associated symptoms	191 (63.6%)
Fever with rigor, sweeting, headache, bodyache, palpitation	109 (36.4%)
Low grade temperature 99- 101 °F	198 (66%)
High grade temperature 102-104 °F	102 (34%)
Mild Anemia	210 (70%)
Moderate to severe Anemia	90 (30%)
Splenomegaly	45 (15%)

Table-2: Shows hematological parameters, examination of peripheral blood smears by microscopy and Immunochromatography testin patients with malaria

Hematological Parameters	Thin & Thick Peripheral Blood Smears
Complete blood count Hemoglobin gm/dl 9.5±2.5 Total leucocyte count/cumm 15500±10500	The Trophozoites & Gametocytes of P.vivax in 230 (76.6%) patients. The Trophozoites & Gametocytes of P.falciparum in 70 (23.4%) patients.
Neutrophilia 80±5	Immunochromatography test
Eosinophilia 10±2	Plasmodium vivax 103 (34.3%)
Lymphocytopenia 15±4	Plasmodium falciparum 10 (3.3%)
Platelet count/cumm 170000±130000	Negative 187 (62.4%)

DISCUSSION:

About 3.2 billions of malaria cases, 466,000 malarial deaths occurred through out the world and Pakistan is one of the malaria endemic countries where 29% of the population lived in areas of high malaria transmission as reported by World Health Organization(WHO)and UNICEF.[8] Malaria is a serious health problem in Pakistan, about 60% population in endemic region was affected with malaria, in spite of well established malaria control program, 500000 malaria cases and 50000 death due to malaria occurred per year in Pakistan as reported by Khattack A.A et al.[9] They stated that incidence of P.vivax malaria was higher than the P.falciparum and other mixed species in our country, most of the cases of malaria were reported from provinces of Baluchistan and Sindh including Karachi and Hyderabad had an overall malaria prevalence of 11%, with very few P. falciparum or mixed species infections. In contrast, previous studies have shown that approximately one-quarter to one-half of malaria cases were attributed to P. falciparum in the above two cities as reported by Nizamani A et al.,Beg MA et al., and Hayyat SA et al.[10-12]

Choudhry ZJ et al.,[13] showed 200 febrile patients with malaria including 88.5% male,11.5% female at their ages ranged between 2-81 years had fever, splenomegaly, anaemia and thrombocytopenia in 71.5%, 69.5%, 50% and 88% respectively. They stated that P.vivax and P.falciparium malaria were 81% and 19% cases respectively and male predominance might be due to increased susceptibility of males to mosquito bites due to their outdoor activities. But females were not only better covered up to escape mosquito bites but there are fewer opportunities for them to seek medical advice in our country.

Erhabor O et al.,[14] founded anaemia 56.5% and 53% thrombocytopenia among the Nigerien children and thrombocytopenia in malaria were observed by Jojera et al, Haroon et al and Abro et al in 83-89.92%.[15-17]

Similar observations made by our study. Majority of malaria patients are known to have TLC and absolute neutrophil count within normal range as described by above studies. while there is lymphocytopenia in 25.5%as compare to the study conducted by Van Wolfswinklel ME et al.,[18] who detected lymphocytopenia in malaria. Ullah Z et al.,[19] detected ICT malaria test positive for P.Vivax and falciparum in 184 (39.1%) and 10 (2.1%) respectively while 276(62.8%) cases were negative for ICT malaria test out of 470 patient. The similar or slightly different observations in our study.

CONCLUSION:

We conclude that the frequency of P.vivax malaria was higher then the P.falciparium malaria in our district area. Facilities for detection of Plasmodium species of malaria by PCR test would be required that is confirmatory test for malaria. Pakistan faces several challenges in the management and control of malaria, including misdiagnosis, lack of diagnostic facilities, use of

presumptive treatments and unavailability of Immunochromatography test; therefore, malaria control efforts should be focused on our district area in Sindh, where malaria prevalence is highest. Emphasis would be placed on improving early diagnosis, prevention and treatment of malaria to reduce mortality and morbidity rate.

REFERENCES:

1. Assefa S, Lim C, Preston MD, Duffy CW, Nair MB, Adroub SA, Kadir KA, Goldberg JM, Neafsey DE, Divis P, Clark TG. Population genomic structure and adaptation in the zoonotic malaria parasite Plasmodium knowlesi. Proc Natl Acad Sci. 2015;112 (42): 13027-32.
2. Lee PC, Chong ET, Anderios F, Lim YA, Chew CH, Chua KH. Molecular detection of human Plasmodium species in Sabah using PlasmoNex™ multiplex PCR and hydrolysis probes real-time PCR. Malar J. 2015;14(1):1-7.
3. Martins AC, Araújo FM, Braga CB, Guimarães MG, Nogueira R, Arruda RA, Fernandes LN, Correa LR, Malafronte RD, Cruz OG, Codeço CT. Clustering symptoms of non-severe malaria in semi-immune Amazonian patients. PeerJ. 2015;3:e1325.
4. Akhtar S, Gumashta R, Mahore S, Maimoon S. Hematological changes in malaria: a comparative study. IOSR Journal of Pharmacy and Biological Sciences. 2012;2(4):15-9.
5. Naveen E, Arora D, Agarwal V. Detection of malarial parasite by blood smear examination and antigen detection: A comparative study. Int J Med Res Health Sci. 2013;2(1):30-4.
6. Mouatcho JC, Goldring JD. Malaria rapid diagnostic tests: challenges and prospects. J Med Microbiol. 2013;62(10):1491-505.
7. Othman RA, Eldeek HE, Almatary AM, Sayed AA, Alsakaf A. Detection of malaria in healthy blood donors using PCR in an endemic area in Yemen. J Adv Parasitol. 2015;2(2):40-7.
8. World Health Organization and UNICEF. malaria report 2015 [Internet]. Geneva: Available from: http://www.who.int/malaria/publications/world_malaria_report_2015/report/en/
9. Khattak AA, Venkatesan M, Nadeem MF, Satti HS, Yaqoob A, Strauss K, Khatoon L, Malik SA, Plowe CV. Prevalence and distribution of human Plasmodium infection in Pakistan. Malar J. 2013;12(1):1-8.
10. Nizamani MA, Kalar NA, Khushk IA. Burden of malaria in Sindh, Pakistan: a two years surveillance report. J Liaquat Uni Med Health Sci. 2006;5(2):76-83.
11. Beg MA, Sani N, Mehraj V, Jafri W, Khan MA, Malik A, Menezes E, Hussain R, Smego R. Comparative features and outcomes of malaria at a tertiary care hospital in Karachi, Pakistan. Int J Infect Dis. 2008;12(1):37-42.
12. Hayyat AS, Memon F, Shaikh N, Dero AF: Incidence and Pattern of Malarial Infection at a Tertiary Care Hospital of Hyderabad. World J Med Sci. 2009;4(1):9-12.
13. Chaudry JZ, Mahmood K, Hussain MA, Tahirkheli MU. Spectrum of Clinical and Haematological Findings in Malaria. Gomal J Med Sci. 2015;13(2):100-3.
14. Erhabor O, Mohammad HJ, Onuigue FU, Abdulrahaman Y, Ezimah AC. Anaemia and Thrombocytopenia among Malaria Parasitized Children in Sokoto, North Western Nigeria. J Hematol Transfus. 2014;2(2):1-6.
15. Jojera AS, Hathila RN, Patel PR, Tailor HJ. Changes in WBC and platelet count in patients with malaria: a hospital based comparative study. Int J Res Med Sci. 2013;1(4):401-3.
16. Haroon H, Fazel PA, Naeem M, Mobin A, Naqvi AH, Makki K. Hide and seek: hematological aspects of malaria-a developing country perspective. J Infect Dev Ctries. 2013;7(3): 273-9.
17. Abro AH, Ustadi AM, Younis NJ, Abdou AS, Hamed DA, Saleh AA. Malaria and hematological changes. PaK J Med Sci. 2008; 24(2):287-91.
18. van Wolfswinkel ME, Vliegenthart-Jongbloed K, de Mendonça Melo M, Wever PC, McCall MB, Koelewijn R, van Hellemond JJ, van Genderen PJ. Predictive value of lymphocytopenia and the neutrophil-lymphocyte count ratio for severe imported malaria. Malar J. 2013;12(1):1-8.
19. Ullah Z, Noor B, Nadeem MF, Hayyat A, Khattak AA. Evaluation of immunochromatographic (ICT) assay and microscopy for malaria diagnosis in endemic district Dera Ismail Khan. Int J Biosci. 2015;6(8):37-42.