CODEN [USA]: IAJPBB ISSN : 2349-7750

INDO AMERICAN JOURNAL OF
PHARMACEUTICAL SCIENCES

SJIF Impact Factor: 7.187
http://doi.org/10.5281/zenodo.4399139

Avalable online at: http://www.iajps.com *Research Article*

INCIDENCE OF SUBMICROSCOPIC MALARIA BLOOD DONOR PARASITE OUTBREAK IN LAHORE PAKISTAN

[1]Dr Muhammad Danial Malik, [2]Dr Muhammad Ali, [3]Dr Sadia Riaz

[1]Central Park Medical College, [2]DHQ Teaching Hospital Sahiwal, [3]Aziz Bhati Shaheed Hospital Gujrat.

Article Received: October 2020 **Accepted:** November 2020 **Published:** December 2020

Abstract:

Aim: *Malaria can be spread by blood bonding from human to human and is responsible for the lion's share of bonding sent by irresistible diseases around the world. In Asia, it has been assessed that about one-fourth of blood donors contain intestinal disease parasites. Since rapid analytic tests and thick blood clotting microscopy involve low-thickness parasitaemia, particularly in asymptomatic adults, the most reliable technique for investigating the issue of bonding communicated Malaria is nucleic corrosive atomic methodologies, such as quantitative polymerase chain response. The investigation was undertaken to determine the prevalence of sub-minuscule intestinal parasite infection among blood donors in Malabo, Equatorial Guinea.*

Methods: *Between March 2019 to February 2020, a total of 200 individual blood samples from the Malabo Blood donation center were obtained and screened through fast symptomatic tests and a dense blood clotting microscopy. Our current research was conducted at Mayo Hospital, Lahore from March 2019 to February 2020. Reflectively, related examples have been tested for the existence of undetected, low-thickness Malaria parasites using quantitative polymerase chain response.*

Results: *In comparison to 7.7 per cent (15/210) of the fast symptomatic test and 3.1 per cent (5/210) of the microscopy, the extent of Plasmodium falciparum positive blood donations investigated by the quantitative polymerase chain reaction was slightly higher (26 per cent, 52/200). P. falciparum positive blood gift densities ranged from 0.06 to 3707.0 parasites/µL with 79.6 per cent below 100 parasites/µL and were thus not detectable by non-atomically Malaria demonstrative studies. qPCR-based species ID showed that P. falciparum was the overwhelming species responsible for 88.1 percent (52/59) of positive blood contributions due to Plasmodium malaria (15.3 percent, 9/59) and Plasmodium ovale (3.4 percent, 2/59).*

Conclusion: *This investigation confirms that sub patent intestinal disease mixing between blood donors is prevalent in endemic settings of jungle fever. P. falciparum, P. malaria and P. ovale parasites have been found in the blood obtained from solid donors living in Malabo. As of now commonly used intestinal disease symptomatic instruments have skipped more than 78% of P. falciparum containing blood donations, indicating an approximation of quantitative polymerase anchor reaction to identify accurate low-thickness P. falciparum contaminations. As the usability of atomic symptomatic techniques in endemic intestinal disease nations is still limited, the blood recipients residing in endemic Malaria should be discussed following WHO proposals.*

Keywords: *Incidence of submicroscopic malaria, Blood donor parasite outbreak, Lahore Pakistan.*

Corresponding author:

Dr.Muhammad Danial Malik,

Central Park Medical College.

QR code

Please cite this article in press Muhammad Danial Malik et al, ***Incidence Of Submicroscopic Malaria Blood Donor Parasite Outbreak In Lahore Pakistan.,*** *Indo Am. J. P. Sci, 2020; 07(12).*

INTRODUCTION:

Intestinal disease is communicated to the human host by the bite of a female Anopheles mosquito at the time the sporozoites stage is immunized during management. The parasite goes through a generation of proerythrocyte stage of the liver that is clinically calm and lasts from 1 to 14 days before the arrival of merozoites in the circulatory system [1]. These merozoites rapidly contaminate red platelets, initiating the biogenetic blood stage during which the parasite passes through biogenetic replication patterns that include the ring, trophozoite and schizontal stages, resulting in the usual fever scenes [2]. In adult human populations living in countries where Malaria is endemic, the frequency of infection with under patented intestinal diseases can be as high as 83%, with some clones of the parasites being transmitted to the human host within 300 days. Screening for intestinal disease is done by testing blood samples from people who are likely to be infected [3]. The gold standard for the analysis of Malaria remains the light microscopy of blood spots that spread. Thick blood stains give a feeling of affection and thin smears make it possible to identify the different species of Malaria and to quantify the disease [4]. Rapid Demonstrative Tests (RDTs) are generally used because they are less dependent on the accessibility of research facilities and can also be used by untrained welfare workers. RDTs are routinely based on the histidine-rich protein 2 determined by the parasite for the delicate and explicit localization of P. falciparum, and on the lactate dehydrogenase or aldolase compound for the Pan-Plasmodium localization of all species of human infectious intestinal diseases. The lower limit of localization (LOD) for microscopy is between 50 and 500 parasites/µL depending on the expertise of the microscopes and 100 parasites/ µL for P. falciparum RTDs based on PfHRP2 [5]. Differential determination of P. ovale, P. malaria, P. vivax, and P. Knowles is hampered by the shallow blood stage diseases and the difficulty in distinguishing these species due to trophozoite morphology under the microscope. Advances in nucleic corrosion intensification are costlier and require a more advanced research framework, while allowing much better affectability.

METHODOLOGY:

The investigation was directed against the Central Blood Bank in Malabo, on the island of Bioko. The island of Bioko, located in West Central Africa and home to the capital of Equatorial Guinea, Malabo, is 35 km from the Cameroonian coast. Between March 2019 to February 2020, a total of 200 individual blood samples from the Malabo Blood donation center were obtained and screened through fast symptomatic tests and a dense blood clotting microscopy. Our current research was conducted at Mayo Hospital, Lahore from March 2019 to February 2020. The approximately 260,000 people living in Malabo are at risk of Malaria all year round. Adults who are willing to donate blood and who have hepatitis B, hepatitis C and are HIV-negative have been qualified to donate blood. Microscopy and RDT were used to screen for intestinal disease at the blood donation center and the results were kept at the blood donation center until the QPPQ survey was completed. The focal blood bank in Malabo has about 100 benefactors per month; most are benefactors who help their companions and families in crisis circumstances, and the rest are benefactors who deliberately donate blood on a standard basis. Between July and August 2017, a sum of 200 blood donations from routine guests were chosen to conduct this review. Whole blood was collected in EDTA tubes as part of the blood donation center's standard blood donation strategies. The blood was immediately used for microscopy and TDR, with the remaining blood being rapidly stored at -25°C. The samples were shipped in a cold box to the Malaria Vaccine Initiative research center in Malabo, Equatorial Guinea. The EGMVI research center, located on the premises of the La Paz Hospital in Malabo, which conducted the initial preliminary clinical research in the historical context of the nation, was used for RCPQ testing of the blood donations. The 220 blood tests, from solids, hepatitis B, hepatitis C, and HIV-1 and HIV-2 negative blood, were examined for the presence of undetected low-level intestinal disease parasites, using very delicate qPCR tests.

Figure 1:

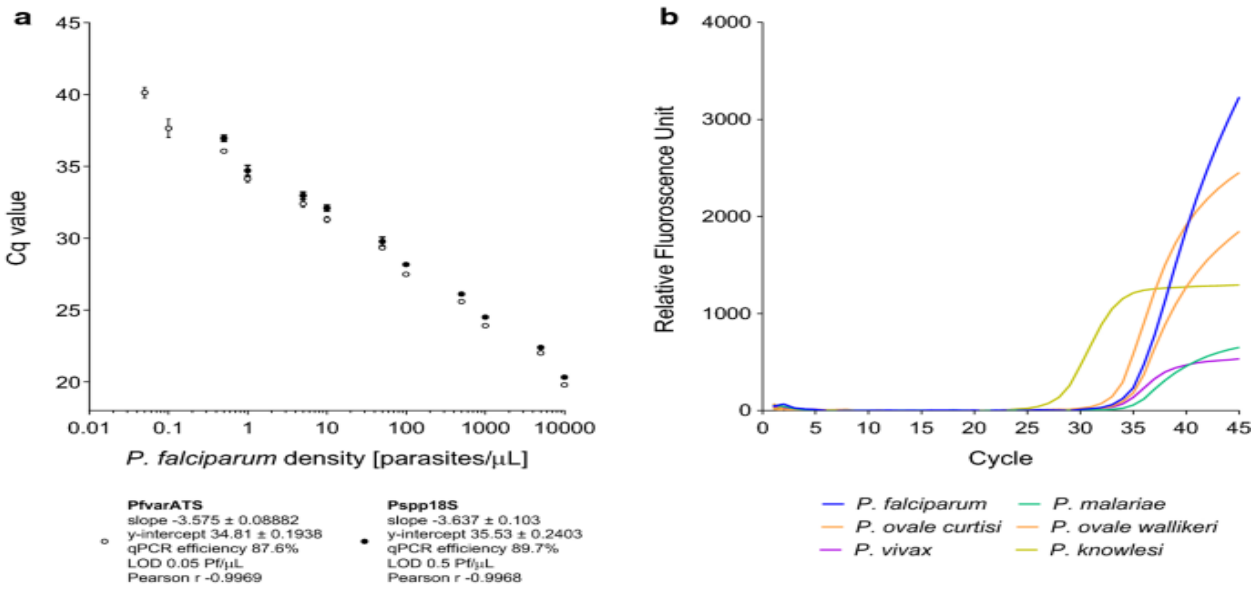
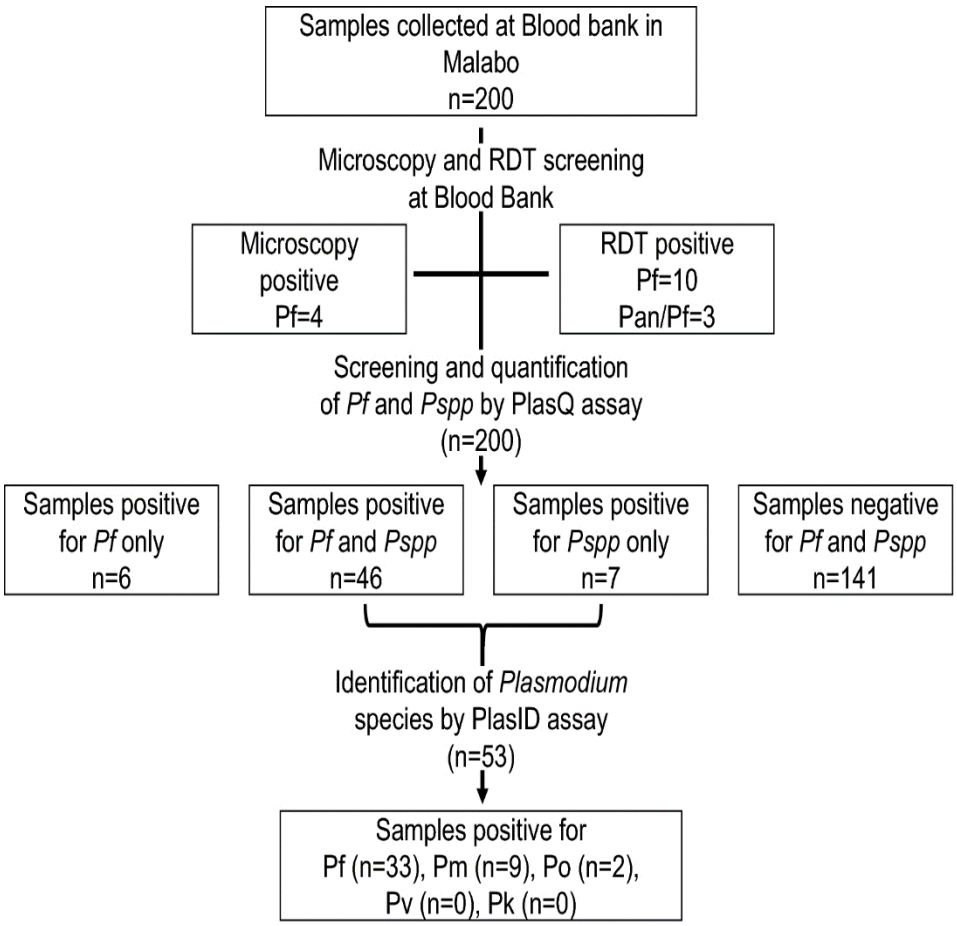


Figure 2:



RESULTS:

Two free RCPQ tests were deliberately used for screening and proof of distinction of Malaria parasites. The use of two successive qPCR tests amplifies the measurement of the data produced by the examination. The first measure, applied to all examples, was intended to distinguish and assess P. falciparum or potentially non-falciparum species. In addition, internal control serves as an overall quality control and execution control of the DNA extraction and qPCR response. The PlasQ measurement exposure is shown in Fig. 1a. For the two targets, PfvarATS and Pspp18S, Cq estimates for different parasite densities ranging from 0.06 to 11,000 parasites/ µL were acquired (Pearson r - 0.9968 and - 0.9969, separately). Comparable yields of Cq for the two targets were observed (89.7% and 87.8%). The PfvarATS target identified two additional examples of low parasite densities (0.1 and 0.06 parasites/µL), which caused an LD several times lower than the Pspp18S target. The second test, which is applied to all positive examples of Plasmodium spp. was designed for the rapid identification of five distinct Plasmodium species responsible for intestinal disease. The performance of the PlasID test was evaluated using highly characterized clinical examples as references and the ability to recognize P. falciparum, P. malaria, P. ovale curtisi, P. ovale walker, P. vivax and P. Knowles is shown in Fig. 1b. The beneficial qualities of blood are shown in Table 1. All contributors were Equato-Guineans living in Malabo on Bioko Island, with the exception of two individuals, one from the nearby town of Douala, Cameroon, and the other from the United States. The dominant share was male (89.6%) with an average age of 35 years, ranging from 18 to 57 years. Seventy-seven donations came from voluntary blood donors; in addition, 128 donations came from surrogate donors, who donate blood when someone in the patient's family or network needs it (Table 1). Apart from circulatory pressure, no critical contrasts corresponding to gender, age, weight, heart rate and pallor between these two groups of contributors were found.

Figure 3:

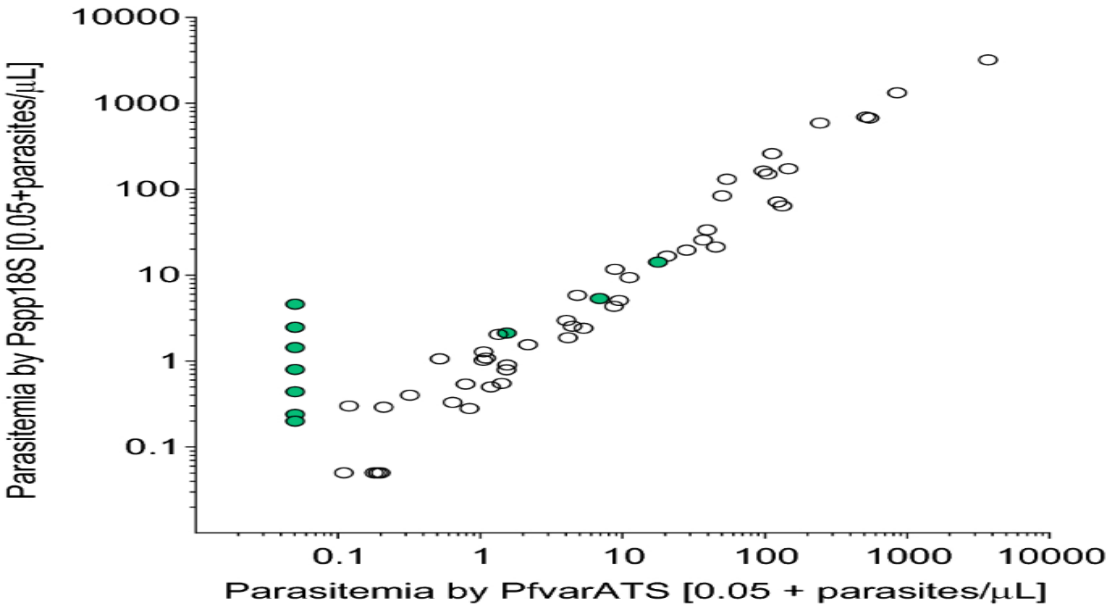


Figure 4:

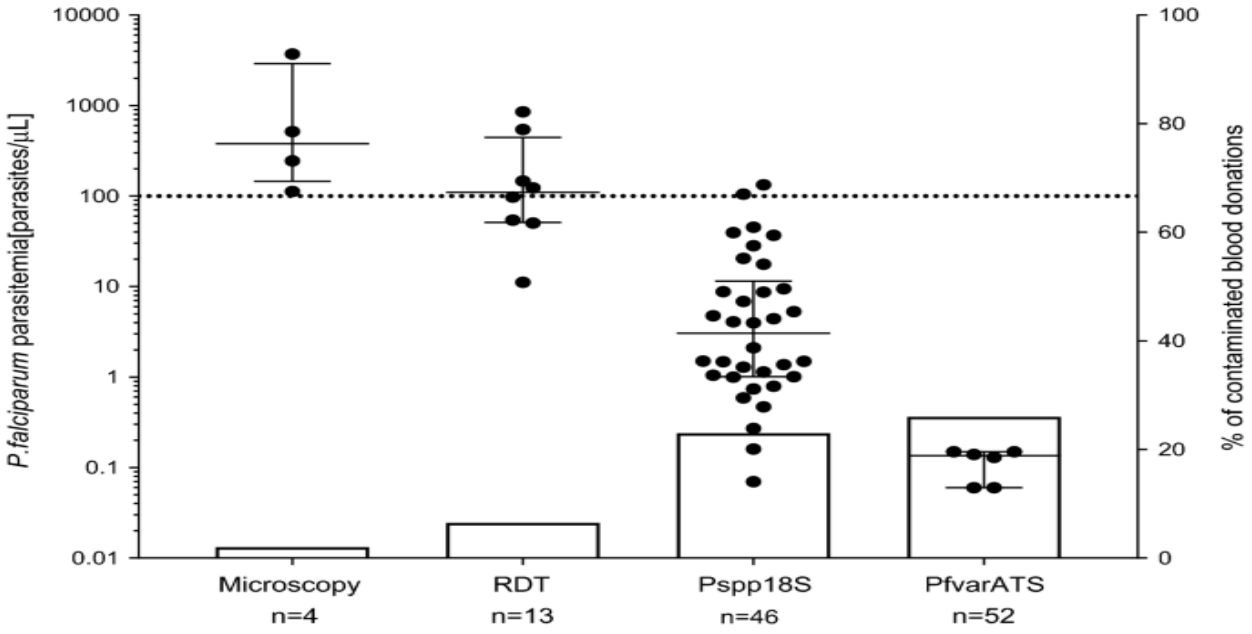


Table 1:

tion time in days

Species	TTM (95% CI)	MTM (95% CI)[a]	p value[b]
P. falciparum	25.7 (7.4–43.9)	13.1 (7–27)	0.172
P. malariae	63.9 (43.5–84.4)	34.8 (27–37)	*0.006*
P. ovale	19.0 (11.7–26.3)	13.6 (8–31)	0.118
P. vivax	29.3 (12.3–46.2)	13.4 (11–16)	0.060
P. knowlesi[c]	15.5 (9.1–21.9)	10.0 (/)	0.058

CI confidence interval

Significance threshold p value <0.05 (in italic)

[a] As reported by Dover and Schultz [9]

[b] Obtained through one sample two-tailed Student's t test, using the MTM mean value for the null hypothesis

[c] A range of the mean incubation time for this species in humans was not available in literature, so a direct comparison of CIs was not possible

Table 2:

Tests	Receptor		Infected donor
	Before transfusion	After transfusion	
PCR	ND	ND	*P. malariae*
TBS	ND	*P. malariae*	*Plasmodium* sp
IFAT-*Pm*	Negative	ND	Positive
ELISA *Pf*	Negative	ND	Negative
ELISA *Pv*-MSP1$_{19}$	Negative	ND	Positive

PCR - polymerase chain reaction; TBS - thick blood smear; IFAT - indirect fluorescent assay test; ELISA - Enzyme-linked immunosorbent assay; ND - not done.

DISCUSSION:

This review, carried out in Equatorial Guinea, expands on past perceptions of the quality of TTM in Asia, and presents estimates of how TTM can reliably identify under patented P. falciparum and non-P. falciparum parasites of intestinal disease, including P. malaria and P. ovale [6]. In addition to P. falciparum, other species responsible for intestinal disease, e.g. P. vivax, P. malaria and P. ovale, were represented in a circle on Bioko Island, as were neighboring West African nations [7]. The binding of one of these Malaria species during blood donation can cause severe illness in recipients. In Asia, those most at risk are weak newborns, young people, pregnant women, or those who suffer from severe illness during child conception [7]. Despite the high recurrence of TTM in endemic areas of jungle fever, semi-resistant beneficiaries can generally control parasite replication and thus clinical outcome [8]. In countries where intestinal disease is not endemic, TTM should also be considered to ensure the safety of blood donations [9]. In this case, recipients are mainly people with intestinal disease and immunological control of related parasites is non-existent, causing a risk of severe infection with intestinal disease. P. falciparum parasites have been found to thrive in blood donations for 17 days, limiting the possibility of killing intestinal disease during the preparation and capacity of blood donations [10].

CONCLUSION:

More than one-fourth of the blood gifts from sound donors living in Malabo is infected with Malaria parasites. Three species, including P. falciparum, P. malaria and P. ovale, were differentiated using two distinctive qPCR tests. Any of these contaminations were not distinguished by the currently commonly used Malaria demonstrative apparatus, e.g. RDTs and microscopy. As the usability of atomic symptomatic techniques in endemic Malaria nations is still limited, the blood recipients living in endemic intestinal disease nations should be treated following WHO suggestions.

REFERENCES:

1. Srisutham S, Saralamba N, Malleret B, Rénia L, Dondorp AM, Imwong M. Four human *Plasmodium* species quantification using droplet digital PCR. PLoS ONE. 2017;12:e0175771.
2. Chew CH, Lim YAL, Lee PC, Mahmud R, Chua KH. Hexaplex PCR detection system for identification of five human *Plasmodium* species with an internal control. J Clin Microbiol. 2012;50:4012–9.
3. Hopkins H, Gonzalez IJ, Polley SD, Angutoko P, Ategeka J, Asiimwe C, et al. Highly sensitive detection of malaria parasitemia in a malaria-endemic setting: performance of a new loop-mediated isothermal amplification kit in a remote clinic in Uganda. J Infect Dis. 2013;208:645–52.
4. Kamau E, Alemayehu S, Feghali KC, Saunders D, Ockenhouse CF. Multiplex qPCR for detection and absolute quantification of malaria. PLoS ONE. 2013;8:e71539.
5. Kamau E, Tolbert LS, Kortepeter L, Pratt M, Nyakoe N, Muringo L, et al. Development of a highly sensitive genus-specific quantitative reverse transcriptase real-time PCR assay for detection and quantitation of Plasmodium by amplifying RNA and DNA of the 18S rRNA genes. J Clin Microbiol. 2011;49:2946–53.
6. Murphy SC, Prentice JL, Williamson K, Wallis CK, Fang FC, Fried M, et al. Real-time quantitative reverse transcription PCR for monitoring of bloodstage *Plasmodium falciparum* infections in malaria human challenge trials. Am J Trop Med Hyg. 2012;86:383–94.
7. Adams M, Joshi SN, Mbambo G, Mu AZ, Roemmich SM, Shrestha B, et al. An ultrasensitive reverse transcription polymerase chain reaction assay to detect asymptomatic low-density *Plasmodium falciparum* and *Plasmodium vivax* infections in small volume blood samples. Malar J. 2015;14:520.
8. Hofmann N, Mwingira F, Shekalaghe S, Robinson LJ, Mueller I, Felger I. Ultra-sensitive detection of *Plasmodium falciparum* by amplification of multi-copy subtelomeric targets. PLoS Med. 2015;12:e1001788.
9. Mangold KA, Manson RU, Koay ESC, Stephens L, Regner M, Thomson RBJ, et al. Real-time PCR for detection and identification of *Plasmodium* spp. J Clin Microbiol. 2005;43:2435–40.
10. WHO. Screening donated blood for transfusion–transmissible infections: recommendation. Geneva: World Health Organization; 2010.