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SCREENING OF MALARIA PARASITES AMONG BLOOD BANK DONORS IN KOSTI TEACHING HOSPITAL, WHITE NILE STATE, SUDAN

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Article Received on 07/07/2017

Article Revised on 27/07/2017

Article Accepted on 18/08/2017

ABSTRACT

Introduction: Malaria transmitted through blood transfusion occurring in malaria has been reported and documented endemic areas leading to severe illness for the recipients. **Methods:** Hundred blood donors were enrolled, 2 ml of EDTA anticoagulated blood was collected from each donor for thin and thick blood smears and (ICT). **Results:** Malaria parasites were detected in 12% by microscopic examination, and 6% by (ICT). **Conclusion:** The results clearly demonstrate occurrence of malaria parasites in blood transfusion donors in Kosti Teaching Hospital, which may result in transmission of infection. Each findings it is recommended that blood donors must be screened for malaria parasites.

KEYWORDS: Malaria, Blood transfusion, Sudan.

INTRODUCTION

Malaria is a mosquito-borne infectious disease affecting human and animals, caused by parasitic protozoa belonging to the phylum Apicomplexa.^[1] It causes high rate of morbidity and mortality in tropical countries, *Plasmodium vivax*, *Plasmodium ovale*, *Plasmodium malariae* with *Plasmodium falciparum* being the most virulent which cause 80-90% of malaria infections.^[2] They are distributed throughout the tropics, subtropics, and temperate zones.^[3] It is estimated that about 515 million episodes of clinic episodes of falciparum malaria in 2002, globally about 50% higher than reported by WHO and 200% higher for areas outside Africa^[4]. In Khartoum, Abdel Hamid, et al (2015) found about 20% of 79 individuals were PCR positive for *P.falciparum*.^[5]

Although blood transfusion can save life but it can also transmits a number of blood borne pathogens, and to avoid these transfusion transmitted infections (TTIs) critical screening processes must be done to ensure the safety of blood transfusion.^[6] Transfusion transmitted malaria (TTM) is present in highly endemic and also malaria free-countries, and it can be fatal.^[7]

This study aimed to check the possibility of occurrence of malaria parasites in blood donors collected in Kosti Teaching Hospital.

METHODS

Study site

This study was conducted during March and April 2017 in Kosti Teaching Hospital, which is a tertiary care hospital,. Kosti city is located in the White Nile State, South Sudan. where malaria is hyper-endemic with stable transmission pattern.

Sample collection

Blood from 100 male donations were obtained from the blood bank of Kosti Teaching Hospital. Two ml of EDTA anticoagulant blood was collected from each donor for conventional thick and thin blood smears and immunochromatography (ICT), ICT was performed in Kosti and examination of blood smears was performed in Parasitology Department, Faculty of Medical Laboratory Sciences, University of Khartoum.

Microscopic examination

Conventional thick and thin blood smears were made and stained with 10% Giemsa (PH 7.2). The slides were subsequently examined for the presence of malaria parasites under oil immersion (100 X).

Rapid diagnostic tests

Bio Tracer™ Malaria P.f/PAN rapid card (Bio Focus Co., Ltd. South Korea).

RESULTS

The results showed that all donors were males, their median age was 32 years with minimum age 18 years and maximum age of 50 years. All the blood samples were tested for the presence of malaria using blood films and ICT, malaria parasites were detected in 12% by microscopic examination and 6% by ICT. as indicated in table 1.

Table 1: The frequency of malaria parasitaemia among donors by the two diagnostic methods.

		Blood film (GSTD)		Total
		Positive	Negative	
RDT	Positive	6	0	6
	Negative	6	88	94
Total		12	88	100

Table 2: A comparison between blood film and ICT for the detection of *P.falciparum* and other species.

Infection	Blood film (GSTD)	RDT
Infected by <i>P.falciparum</i>	10	6
Infected by <i>P.vivax</i>	2	0
Non infected	88	94
Total	100	100

DISCUSSION

This study determined the prevalence of malaria parasitaemia in blood transfusion donors, who did not manifest clinical signs of malaria (no fever or recent history and or malaria). Out of 100 donors, 12 % (n=12) were Positive for malaria parasites. The parasites detected among those donors were *P.falciparum* and *P.vivax*, with prevalence 10% and 2% respectively. The high prevalence (12%) of malaria parasites detected by microscopic examination in our study was higher than that reported by Ali, et al in Sudan, 2001 they collected 1546 samples and found 102 positive samples using thick and thin blood film (8). And by Abdel Hamid, et al also in Sudan 2015 they collected 200 samples and they found 6% by microscopic examination, 6.5% by immunochromatography tests and 18.5% by molecular techniques(5), and this is due to the hyper-endemic study area (Kosti). While the prevalence (6%) of malaria parasites detected by immunochromatography tests in our study and their study is consistent. As it demonstrated by table (1).

Four samples were positive for *P.falciparum* by microscopic examination and negative by ICT and this may be due to deletion of Histidin Rich protein II (HRP-II), and two samples were positive for *P.vivax* by microscopic examination and negative by ICT, this may be due to low infectivity of *P.vivax* related to *P.falciparum*.

CONCLUSION

This study showed that a blood intended for donation carried malaria parasites in Kosti Teaching Hospital. So active laboratory procedures need to be conducted

exclude potential malaria-infected individuals from donation and also extreme sensitive malaria diagnostic methods must be developed to prevent transfusion transmitted malaria.

ACKNOWLEDGMENT

Special thanks for blood bank staff of Kosti Teaching Hospital, and Parasitology Department, Faculty of Medical Laboratory Sciences, University of Khartoum.

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