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Short Communication

Ile Malaria infection among blood donors in Eldmazin Town, Blue Nile State Sudan

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Abstract

The study was conducted at Eldamazin town, the capital of the Blue Nile State which is located 525Km South of Khartoum the capital of Sudan. The State extends from Sinnar State in the North, bordering Ethiopia in the East and the Upper Nile State into the West and South. It is an agricultural and postural state. The population of this state is 861000 persons (census, 2009) most of them are farmers and animal breeders. This study was aim to determine the prevalence and species of malaria infection among blood donors who attending to the teaching hospital. One hundred males' subjects were investigated during period from July up to October 2010. Their age range between (19-40) years. Two malaria tests were used thick and thin blood films and Immuochromatoghic test (ICT). The percentage of infected were (12%) subject by p. falciparum. The high prevalence of malaria p.falciparum among age group was found to be in (<25) years, no significant difference in the prevalence between married (5%) group and single (7%) Table-1, and no other risk factors previous blood transfusion, was found to be significant. There was no significant difference observed between two techniques used for detection malaria BFFM and ICI. The BFF has highest combined sensitivity and specifies. We concluded that the highest prevalence of malaria among age group (≤ 25) years and (26-0) years.

Keywords: Malaria, blood transfusion, p.falciparum.

Introduction

Malaria is one of the important problems in many countries, especially in tropical areas[1]. The infection with malaria parasite may cause a variety of clinical symptoms, depending on a combination of different factors, including the virulence of the parasite isolate, host-related factors, such as the immune status and genetic makeup[2,3]. The symptoms of disease were no specific and include headache and pains in the back and limbs, anorexia nausea, chill and continuous or remittent fever[4]. The medical use of blood and blood derivative was increasing all over the world despite the hazards related to transmission of protozoal, spirochaeted, bacterial, and viral diseases. Whole blood was stored at temperature range of 1-6˚cat which the rate of glycolysis was considerably lower than 37˚C, sufficient lactic acid produced causing progressive fall in the pH which in turn leads to halting glycolysis[2]. Malaria sometimes called "king of diseases" caused by protozoan parasite of the genus plasmodium. The most serious and sometimes fatal type of malaria was plasmodium flaciparum. The other malaria species, P.vivax, P.ovale, P.malaria and P.knowlesi which can cause acute, severe illness, but mortality rate were low. Malaria was the most important infection disease in tropical and sub-tropical regions, and continues to be a major global health problem, with over 40% of world's population exposed varying degrees of malaria risk in some 100 countries it estimated that over 500 million people suffer from malaria infections annually, resulting in about 1-2million death, of whom 90% are children in sub-Saharan Africa[1]. The number of malaria cases worldwide seems to be increasing, due to increasing transmission risk in areas where malaria control declined. The increasing prevalence of drugs resistant strains of parasites, and in a relatively few cases massive increases in international travel, and migration[2]. The need for effective and practical diagnostics for global malaria control was increasing, since effective diagnosis reduces both complication and mortality of malaria. Differentiation of clinical diagnosis from other tropical infection, based on patients signs and symptoms or physicians finding, many be difficult, there for confirmatory diagnosis using laboratory technologies were usually need[3]. Transfusion malaria is one of the most dreaded public health problems in highly endemic malaria countries[5]. The transmission of malaria by blood transfusion was one of the first recorded incidents of transfusion–transmitted infection[6]. The ability of screen the donation, as well as the donors, can decrease significantly and risk of TTM, there were four specific targets for donation screening intracellular parasites plasmodial

antibodies, plasmodial antigen, and plasmidoal DNA. Although there has been some debate over which was the most effective strategies are needed, and that need to develop locally according to needs and resources[7].

Materials and methods

Sample collection: The sample size was 100 subjects of blood donors in Eldmazen Teaching Hospital , Blue Nile State Sudan attended for blood bank.

Ethical Clearance: Written informed consent was given to participant.

Study duration: This study was carried out from July up to December 2010.

Methods: Two well know malaria techniques were used for blood donors attending the bank. i. Immuochromatoghic test (ICT). ii. Thick and thin blood films.

The microscopical observation of malaria parasites was optimal when parasites were fixed and observed in their natural location withinred blood cells after appropriate staining. This was best accomplished with the thin film preparation technique. Unfortunately, thin film has a low sensitivity 100-200 parasites/µL of blood, and it reflects inadequate for low parasitaemic infection. An adequate parasite concentration method was obtained by osmotic lysis of red blood cells releasing the parasites, as the case with the thick film preparation technique, the sensitivity of which was then increased about 10parasites/µL. Experienced technicians may also prepare thick and thin films on the same side. The technique of thin film done by one end of slide was allowed to touch the top of the blood drop on the patient's finger. Only the top of the drop should come into contact with slide. The quantity of blood to be transferred to the slide should not exceed 1.5µL, usually corresponding to diameter of 3-4mm. The edge of second slide (or cover slip) was then laid on the drop of blood. That will spread on the entire line of contact between the two slides. The second slide, steadily held by technician to form a 45 angle with the original side, was then moved to the opposite end of the slide to which the drop was originally located. In the well prepared thin film, the blood film should end with multiple tails not toughing the edges of the slide. Red blood cell should be visible one by one without overlapping. Abnormally thick slide may be the result of an exaggerated volume or of angle larger than 45C°.

Data collection: The primary data were the blood samples from donors, the secondary data were collected by constructing a questionnaire.

Statistics analysis: Data were analysis was performed using Statistical Package for Social Sciences (SPSS) version (16) USA. All data are reported as means ± SD and percentage. Statistical significance was considered as ($p<0.05$).

Results and discussion

The aim of this study was to determine the prevalence of malaria among blood donors in Eldamazin Town Teaching Hospital. The results indicate that malaria was the highly prevalence in Eldamazin Town where the study was conducted. The prevalence of malaria among married group increased compared to single group Table-1. The mean prevalence rate of malaria infection among blood donors was 12%, all of them infected with p.falciparum with parasite count 167-1616 parasite/micro liter of blood. The prevalence rate was 20% among blood donors in this study was agreement with Nodedl H *et al.*[8] in Niger Delth who reported that the prevalence 10.2%, however this results were in disagreement with results observed by Mungai *et al*.[5] in USA and Bakri *et al.*[9] in Wadmadni Town Gazira State Sudan who reported 26.3%. The prevalence of malaria observed in this study was higher than that reported by[11] who reported 6.5%. The distribution of malaria infection according to blood group represented same results in A and O group, but group B presented two cases and (AB) no case Table-2. The prevalence 12% may suggest the possible increase in spread of malaria in Eldamazin Town, the highest rate age group 26-30 ≥36 years. These results reflect that there were no significant difference observed between two techniques used for detection malaria BFFM and ICI. The BFF has highest combined sensitivity and specifies. The relevance of malaria among married groups increased compared to single group Table-1.

Table-1: The effect of marital status of blood donors on malaria infection.

Marital status	Malaria parasite		Total
	Positive	Negative	
Married	9 (5.0%)	31 (35.0%)	40 (40.0%)
Single	7 (7.0%)	53 (53.0%)	60 (60,0%)
Total	16	84	100

Table-2: The distribution of malaria infection according to blood groups.

Blood group	Malaria parasite		Total percentage
	Positive	Negative	
A	5(5.0%)	21(21%)	26(26.0%)
B	2	17	19
AB	6(0.0%)	1(1.0%)	1(1.0%)
O	5(5.0%)	49(49.0%)	54(54.0%)
Total	12	88	100

Conclusion

We concluded that the highest prevalence of malaria among age group ≤ 25 years and 26-30 years, the BFFM, ICT test were accurate and cost effective diagnosis for determining the presence of malaria parasites.

Recommendation: We recommended that screening blood donors for malaria is mandatory and blood film for malaria rapid diagnostic test should be included in screening blood donation.

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