IMPACT: International Journal of Research in Applied, Natural and Social Sciences (IMPACT: IJRANSS)
ISSN(E): 2321-8851; ISSN(P): 2347-4580
Vol. 2, Issue 6, Jun 2014, 177-182

FILARIASIS AMONG ASYMPTOMATIC BLOOD DONORS IN GENERAL HOSPITAL, ODAN MARINA-LAGOS, NIGERIA

BOLAJI OS, UTHMAN-IZOBO SO, OJURONGBE O, OPALEYE OO & ADEYEBA OA

Department of Medical Microbiology and Parasitology, College of Health Sciences, Ladoke Akintola University of Technology, Osogbo, Osun State, Nigeria

ABSTRACT

It has been stated that high prevalence of blood transmissible infections in Africa has compounded the problem of blood shortage in the blood banks as many donors who were positive for any of these infection are automatically excluded from donation. This fact, together with changing population demographics, increased travels with respect to rural urban migration and the problems of commercial donors has made it necessary to determine the prevalence of filarial infection among donors in our health institutions. In this study 300 healthy donors (255 males and 45 females) M: F ratio 8.5:1.5 ratio, age range 18- 50 years were screened, subjects aged 18 years and above and voluntarily consenting to donate blood at the blood bank at General Hospital Marina Lagos between March and July 2010 were screened for Filarial infection. Five milliliters of blood was collected from each subject. The modified thick smear technique stained with Giemsa and Haema to xylin stains were used and examined microscopically. 1(0.33%) was positive for Wuchereria bancrofti, 1(0.33%) had *Mansonella perstans*, while 4(1.33%) had Loa loa. All the donors were male aged 22, 23, 25, 30, 31 and 44 years and were asymptomatic. The average parasite density in the donors was 1.4/20 µL of blood. Because off the possibility off allergic reactions from transfused microfilariae, routine screening for microfilariae should be incorporated into transfusion policy. However, view the generally low apathy to voluntary donation in Nigeria, it may not be justified to exclude potential donor positive for filariasis. Instituting prompt antifilarial treatment for patients receiving such blood may be a credible alternative. The study confirms that blood transfusion will always represent a risk though, small to the recipient. Careful and critical examination of donors to improve quality donor selection and transfusion is essential.

KEYWORDS: Prevalence, Microfilaria, Asymptomatic, Blood Donor, Lagos

INTRODUCTION

Parasitic organisms transmissible by blood transfusion are either plasma borne such as Trypanosomes and Microfilariae or blood cell-associated, such as the Plasmodium species of malaria that are carried in the erythrocytes. (Barbara and Ontreras, 1990; Ukaejiofor, 1996). Blood donation occurs when a healthy person voluntarily has his/her blood drawn. And such a person is referred to as a blood donor. The donated blood is used for transfusion or made into medication by a process called fractionation. Types of donors include voluntary donors, commercial donors and relation donors. A donor comes to the blood bank, he or she is examined for basic eligibility qualities such as skin rashes, the body weight of the donor is ascertained which should not be less than 50 kg, the body temperature, the pulse and blood pressure; systolic and diastolic pressure are checked for and all these must be within the normal range. Also, the age of the donor which should be between 18-50 years and the life style of the donor are asked for (Chessbrough, 2002). Other screening test for donors includes the quality of the donors haemoglobin, a quantitative test to determine the Packed Cell Volume

(PCV) of the red blood cells, syphilis, Human Immunodeficiency Virus (HIV), Hepatitis B surface Antigen (HBsAg) and Hepatitis C virus (HCV) antibodies (Cheesbrough, 2002; Opaleye et al.,2013).

Filariasis is a life-threatening disease which affect human and animals, transmitted to people through the bites of infected mosquitoes, and is caused by nematode parasite of the order filariadae (Sasa, 1979). The epidemiology of the disease in Nigeria is complicated because of the diversity of the environmental conditions of the different regions. Recently, large-scale dam and irrigation projects in addition to deteriorating drainage systems have created suitable breeding sites for filarial vectors in various parts of Nigeria. (Anosike *et al.,* 1995) Consequently, the disease distribution is far more extensive than has been hitherto assumed (Anosike *et al.,* 1995). In the past six decades, various levels of endemicity have been documented in different bioclimatic zones of Nigeria on filariasis.

Filariasis diseases are rarely fatal, but the consequences of infection can cause significant personal and socioeconomic hardship for those who are infected. Clinically asymptomatic individual have hidden pathology such as renal and lymphatic abnormalities (Dreyer *et al.*, 1992). Filaria is a parasitic filarial nematode (roundworm) spread by a mosquito vector. It is one of the three parasites that cause lymphatic filariasis, an infection of the lymphatic system by filarial worms. It affects over 120 million people, primarily in Africa, South America, and other tropical and sub-tropical countries (James *et al.,* 2006). If the infection is left untreated it can develop into a chronic disease called elephantiasis. Limited treatment modalities exist and no vaccines have been developed.

There are known filarial nematodes which use humans as their definitive host. These are divided into 3 groups according to the niche within the body that they occupy: 'lymphatic filariasis', 'subcutaneous filariasis', and 'serous cavity filariasis'. Lymphatic filariasis is caused by the worms Wuchereria bancrofti, Brugia malayi, and Brugia timori (John *et al.,* 2006). These worms occupy the lymphatic system, including the lymph nodes, and in chronic cases these worms lead to the disease elephantiasis. Subcutaneous filariasis is caused by loa loa (the African eye worm), Mansonella streptocerca, Onchocerca volvulus, and Dracunculus medinensis (the guinea worm). These worms occupy the subcutaneous layer of the skin, in the fat layer. Serous cavity filariasis is caused by the worms Mansonella perstans and Mansonella ozzardi, which occupy the serous cavity of the abdomen. In all cases, the transmitting vectors are either blood sucking insects (flies or mosquitoes), or copepod crustaceans in the case of Dracunculus medinensis (Arora and Arora, 2011).

METHODS

The study was conducted in General Hospital Odan Marina, in Lagos State. A total of 300 prospective asymptomatic blood donors (255 males and 45 females) of different ages and socioeconomic status were examined after obtaining ethical approval from medical and research training unit of Lagos State Ministry of Health. The study was conducted from March-July, 2010 by recruiting consecutive consenting patients visiting blood bank of General Hospital marina (Odan) Lagos State, Southwestern Nigeria until a total of 300 participants was attained. Prospective donors were initially sorted using a structured questionnaire on risk behaviour and were physically examined.

Other relevant information of all participants was obtained using a proforma specially designed for this purpose. This study was undertaken to determine the prevalence of blood microfilaria among asymptomatic Nigerian blood donors in order to generate baseline information. Their mirohaematocrit PCV were also checked for. Screenings were done before bleeding them. Aseptically, 5ml of blood samples were collected into EDTA bottle from each donor between the hours of

10am and 2pm during which the parasite is at peak density in the peripheral blood. Two thick films were made from the blood samples on clean grease free glass slide. Each film consisted of about 40ul of blood. The thick blood film was made by spreading drop of blood on grease free slide with the edge of another glass slide to cover an average of about 10mm diameter and allow to air dry. One of the blood films was stained with Giemsa and examined for microfilaria. The remaining blood sample was used for concentration technique in order to detect low density of microfilaria.

Wet Preparation: Wet preparation method was carried out to observe the motility of the parasite. This was done by adding a drop of the blood sample to a drop of normal saline on a clean grease free microscopic slide and then covered immediately with a clean coverslip. The preparation was scanned with x10 and x40 objectives.

Concentration Technique: Venous blood tube concentration techniques was carried out by collecting 2ml of venous blood from the donor and dispensed into 2ml of saponin-saline for lysing the red cells for 5mins; the haemolysed blood solution was spun for 10mins at 200rpm. The sediment was transferred to glass slide and covered with cover slip. It was examined microscopically with x10 and x40 objectives for motile microfilariae.

Identification of Blood Microfilaria

Giemsa Staining Techniques: The thick blood films arranged on the staining rack were flooded with Giemsa stain working solution for 10 minutes and rinse with buffered water. They were allowed to drain dry and examined with oil immersion objective

Mayer's Acid Haemalum Technique: The thick blood films were arranged on the staining rack. Buffered water was added and left for 3min to dehaemoglobinized the film. It was the fixed with methyl alcohol for 1min, the stain was poured on the fixed film and heated gently with flame from a spirit lamp until the stain starts to bubbles up when the flame was removed. Flaming was repeated several times which lasted 10minutes. The slide was blue in running water for 2minutes to blue the nuclei of the microfilaria. They were allowed to drain dried and examined with oil immersion objective.

RESULTS

Out of a total number of three hundred (300) blood specimen collected, only 6(2.00%) were positive for microfilaria. Prevalence of microfilaria was found in the following proportions: Loa loa 4(1.33%), Brugia malayi 1(0.33%), and Wuchereria bancrofti 1(0.33%) as shown in Table 1. In table 2, 255 of the donors examined were male and 45 were female whose age ranged from 18- 50 years. Rate of infection was found to be higher in the male 6(2.35%) than the female (0%), though not statistically significant (P = 0.59).

Table 3 shows that blood group 'O' is the predominant group of blood of all the types of blood group (188/300), also with the highest number of infection with microfilariae. (4/6). The number of microfilariae detected was higher among the artisan/illiterates 5(2.60) and least in the educated group 1(0.93). Since $p < 0.05$, indicating a significant association between educational status of the donors and rate of infection (Table 4).

Table 1: Age Distribution Pattern and Rate of Infection among Subjects

Age (Yrs)	No Examined	Loa Loa	Wuchereria Bancrofti	Brugia Malayi	Total (%)
Below 45years	120	1	1	0	2(1.67)

Table 1: Contd.,

Above 45 years	180	3	0	1	4 (2.22)
Total	**300**	**4**	**1**	**1**	**6 (2.00)**

Table 2: Incidence of Filariasis in Relation to Sex

Sex	No. Examined	No. Positive (%)
Male	255	6 (2.35)
Female	45	0(0.00)
Total	**300**	**6**

P = 0.59

Table 3: Blood Group Distribution Pattern and Rate of Infection among Subjects

Blood Group	No Examined	Loa Loa	Wuchereria Bancrofti	Brugia Malayi	Total (%)
O	188	3	0	1	(2.13)
A	58	1	0	0	1(1.72)
B	43	0	1	0	1(2.33)
AB	11	0	0	0	0(0.0)
Total	**300**	**4**	**1**	**1**	

Table 4: Incidence of Filariasis in Relation to Educational Status of the Subjects

Occupation	No Examined	No Positive	% Positive
Civil servant	108	1	0.93
Artisans	130	3	2.31
Undisclosed/ Illiterates	62	2	3.23
Total	**300**	**6**	

P = 0.001

DISCUSSIONS

The importance of filariasis as a major public health problem varies from one to another, its relatively importance lies in the very large number of individual affected. It is nevertheless a very distinguish diseases which is responsible for great deal of disabilities in the tropics (Anosike, 1995).

This study indicated prevalence of 2.0% of blood filarial in Lagos State, in contrast to the work of (Anosike and Onwuliri, 1994), who reported prevalence of 21.7% in Bauchi; this may be attributed to difference in number of subjects and geographical sites of the study.

The major causative agents identified in the study area were Loa loa, Brugia malayi and Wuchereria bancrofti in the following proportions, 4(1.33%), 1(0.33%) and 1(0.33) respectively. This may be due to period of the day blood samples were obtained for examination.

It was also discovered that blood filariasis were more prevalent among males than females, this variation though not statistically significant (P = 0.59) was also reported by other authors (Mornmers et al, 1995; Manson and Apted, 1982). On the contrary, more females were infected than the male in a study conducted in Brazil (Belding, 1974). Closer degree of man-fly contact according to the occupation of the subjects was also considered. It was observed that the artisan/illiterates were mostly infected as most of them engaged in occupations that involved exposing their bodies thus giving access to day biting vectors. There was a significant association between occupation of the subject and rate of infection (p=0.001).

In the study, blood filariasis in relation to age of the subjects increases with age from 1.67% (<45yrs) and peaked at 2.22 % (>45yrs). In this study, 6 (2.0%) asymptomatic subjects were found to be infected. Clinically asymptomatic infected individual have hidden pathology such as renal and lymphatic abnormalities (Dreyer *et al*, 1992) and early detection and treatment of infected individuals might prevent the pathology and appearance of clinical manifestation.

CONCLUSIONS

The study has revealed the presence of filarial infection among asymptomatic Nigerian blood donors in Lagos city of South Western Nigeria. In endemic areas, all donor blood should however be screened for filarial parasites. Filarial antigen detection test could prove to be more useful in detecting infections. Blood donors with active history of filarial infection should be deferred from donating blood. Filarial antigen detection test may be employed as screening test for blood donors, if possible.

This study also emphasized the need for intensive health education to encourage voluntary donation and promote the interest of females in blood donation. The finding of this study also confirms that blood transfusion will always represent a risk, though small to the recipient. Careful and critical examinations of blood donors to improve good donor selection and transfusion practice are essential (Nmor and Egwunyenga, 2004). It is important to point out that the findings of this study do not reflect the prevalence of markers of transfusion-transmissible infections in the unselected general population. This is because blood donors are a pre-selected group. Further studies aimed at determining the epidemiology of transfusion-transmissible infections among the general population will be of value in determining the population prevalence. Further studies could be undertaken to investigate other epidemiological parameters. On the side of the authority, the Government could reduce the infection rate further down by embarking on health education campaigns and training on filarial prevention particularly educating people on the importance of not providing condusive dwelling places for mosquitoes.

RECOMMENDATIONS

A more eradicative and enlightenment campaign programme should be engaged in by the Government and NGOs.

REFERENCES

1. Anosike J.C., Onwuliri C.O.(1995). Studies on Filariasis in Bauchi State, Nigeria. I. Endemicity of Human Onchocerciasis in Ningi Local Government Area. *Annals of Tropical Med. And Parasitology* 89(1):31-38
2. Anosike J.C and Onwuliri C.O.E. (1994). Studies on Filariasis in Bauchi State, Nigeria. II. The Prevalence of Human Filariasis in Darazo Local Government Area. Applied Parasitology 35; 242-250.
3. Arora, D. R., and Arora, B. (2005). Medical Parasitology, 2nd Edition, *CBS Publisher, New Delhi India*, 196-208.
4. Barbara J.A.J. and Contreras M. (1990). Infectious complications of blood transfusion: bacteria and parasites. *British Medical Journal*, 300: 386-389.
5. Belding L., David, (1974). Text on Parasitology. *Division of Meredity Publishing Company*. New York 3rd Edition 396 – 548.
6. Chessbrough Monica (2002). District Laboratory Practice in Tropical Countries, Low price edition, Cambridge University Press, UK, 348-361.

7. Dreyer G., Ottsen E.A., Galdino E., (1992). Renal abnormalities in microfilaremic patients with bancroftian filariasis. *American Journal of Tropical Medicine and Hygiene* 46:745-751.

8. James, William D. and Berger, Timothy G. (2006). Andrews' Diseases of the Skin: *Clinical Dermatology.* Saunders Elsevier. (2); 150-154.

9. John, David T. & Petri, William A. (2006). Markell and Voge's Medical Parasitology (9th ed.), St. Louis: Saunders Elsevier, ISBN 0721647936.

10. Manson-Bahr and Apted, F.I.C. (1982). Manson's Tropical Diseases 18th Edition. *The English Language Book Society and Balliere* Tindal London Pp. 148-175.

11. Mornmers E.C., Dekker H.S., Richard P., Garica A., Chippan J.P., (1995). Prevalence of Loa loa and Mansonella perstan filariasis in Southern Cameroon. *Trop and Geograph Med.* 47(1):2-5.

12. Opaleye OO, Tijani BA, Zakariyahu TO and Taiwo SS (2013). Prevalence of HBsAg and HIV among blood donors in Osogbo, Osun State, Nigeria. *International Research Journal of Medicine and Medical Sciences*. 1(3) 68-71.

13. Sasa, Manabu. 1979. A review on classification and geographic distribution on Brugian filariasis. Joint *WPRO/SEARO Working Group on Brugian Filariasis.*

14. Ukaejiofor, EO.(1996). Complications of Blood Transfusion. In: Blood Transfusion in the Tropics (Ukaejiofor EO, ed), 1st ed, *Salem Media*, Ibadan, 123-130.