

## Prevalence of Transfusion Transmissible Infections in a Nigerian Tertiary Hospital

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### Abstract

Millions of lives are saved each year through blood transfusion. Nevertheless, blood unscreened for transfusion transmissible infections (TTI) is a major public health problem. The prevalence of HIV, HBsAg, HCV and syphilis among blood donors reflect the status in the community hence the need for this study. A total of 108 donors comprising 11 family replacement donors, 32 voluntary donors and 65 paid donors were tested for antibodies to HIV, HBsAg, HCV and, syphilis using rapid serological screening methods. Among the 108 blood donors screened at the Madonna University Teaching Hospital (MUTH) Elele, the prevalence rates of HIV, HBsAg and HCV were 5.6%, 4.6% and 2.8%, respectively. All of the subjects tested negative to syphilis. The percentage positive based on the donor source was 4.6%, 4.6% and 0.9% for HIV, HBsAg and HCV, respectively among the paid donors, 1% for HIV among the voluntary donor and 1.9% for HCV among the family replacement donors. The prevalence rate for HIV and HBsAg co-infection was 0.9% as only one donor tested positive to both. Blood donors in MUTH Elele are relatively safe but efforts should be intensified in ensuring maximum safety. This can be achieved by screening, counseling and creating awareness on the need to donate blood voluntarily.

**Keywords:** Prevalence; HIV; HBsAg; HCV; VDRL; Screening

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### Introduction

The need for blood transfusion in patients care and treatment cannot be over emphasized [1]. Although the administration of blood or its products as a therapy helps to save lives, it is unfortunately a potent route for transmission of various micro-organisms which invariably leads to infections with varying severity [2]. A transfusion transmissible infection (TTI) can be defined as any infection that is transmissible from person-to-person through parenteral administration of blood or its products. Human Immunodeficiency Virus (HIV), HBsAg and HCV are a public health problem worldwide [3]. Haemotherapy has proved capable of making an impact on developing and adopting new techniques aimed at minimizing the risk of transmission of blood-borne infections through blood transfusion [4]. In the past, the selection of blood donor was considered the most important factor in reducing infections through blood transfusion. With the introduction of serologic test in blood banks, there was an enormous decrease in the most commonly encountered transmitted infectious blood diseases through blood [5]. These infections are blood-borne bacteria, parasites or

viruses depending on their etiologic agents. TTI may also result from new or emerging infectious agents who are not known to be transmitted as TTI but for which there is biologic plausibility of person-to-person transmission as TTI. Such an example is the agent responsible for new variant Creutzfeldt-Jacob Disease (CJD) [6].

Nevertheless, blood borne infectious diseases are still a problem because infected blood is collected before the appearance of serological markers of infection that is immunological window period. Consequences of TTI may be seen as clinical morbidity and mortality after an incubation period characteristic of the agent or recognized only by serologic or other types of laboratory test. If the agent produces chronic infections, clinical morbidity and mortality may not be seen until years after transfusion [7]. World Health Organization (WHO) has accorded the utmost priority to ensure the safety of blood. In essence, it has mandated the screening of blood donors for at least 4 of the TTI namely: HIV 1 and 2; HBsAg; HCV and Syphilis. In many countries of Africa, the bulk of donor comes from family replacement donors (FRD)

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and paid donors (PD). These may be nuclear or extended family members, colleagues at work or school and friends of patients. They donate blood not really for altruistic reasons but out of necessity and often reluctantly. While they may be safe, in their concern to ensure availability of blood for the patient, FRD may hide information which may lead to their rejection as donors. Sometimes, they are paid donors in disguise [8]. Paid donors are people that donate blood in exchange for money or material gain. Paid donors (especially first time) are usually viewed with suspicion. The bias needs to be re-assessed especially as a lot of ambiguity exists even in the western world regarding what is the most appropriate definition of paid donors. It is widely believed that voluntary donors are generally safer donors as compared to FRD and paid donors. This group of donors donate blood out of their own free will without expecting anything in return [9].

For any blood transfusion service to operate there has to be constant blood supply from blood donors and these donors belong to heterogeneous groups of people in the society, differing in their demographic characteristic and the psychological factors that motivate their behavior [10]. Furthermore, the transfusion transmissible infections status of blood donors needs to be ascertained before donation hence the need for this research. We therefore set out to determine the seroprevalence of TTIs among blood donors attending Madonna University Teaching Hospital (MUTH) Elele.

## Subjects, Sample Collection/Analysis

One hundred and eight donors attending Madonna University Teaching Hospital (MUTH) Elele were used for this study. The donors were made up of 65 paid donors (PD), 32 voluntary donors (VD) and 11 family replacement donors (FRD). Verbal consent was obtained from all the subjects prior to enrolment in the study. 4 mL of blood was collected from the subjects into plain containers and was allowed to clot while the expressed serum was collected and used for the analysis using rapid serological screening according to standard methods [11].

## Ethical clearance

The research was approved by the Madonna University ethical committee (MUEC) and was monitored during the research period. Rules and guidelines governing sample collection from humans and processing for research purposes were strictly adhered to.

## Result

Among the 108 blood donors screened at the Madonna University Teaching Hospital (MUTH) Elele, the prevalence rates of HIV, HBsAg and HCV were 5.6%, 4.6% and 2.8%, respectively. All of the subjects tested negative to syphilis. The percentage positive based on the donor source was 4.6%, 4.6% and 0.9% for HIV, HBsAg and HCV respectively among the paid donors, 1% for HIV among the voluntary donor and 1.9% for HCV among the family replacement donors (FRD).

## Discussion

The prevalence of transfusion transmissible infections (TTIs) in blood to be transfused to recipient who by virtue of his/her compromised health status is at a disadvantaged position, calls for serious health concern. Most people infected by these infections have no symptoms and do not know that they carry the infections, but all who are infected can transmit the virus to others. This is further compounded in cases of donors, in that after testing positive to the viruses, counseling is withheld as it is thought that it may frustrate donors and lower the blood pool. The effect of this action is that those uncounseled seropositive donors are innocently infecting the society [12]. In this research, the prevalence rate of HIV, HBsAg and HCV is 5.6%, 4.6% and 2.8% respectively (**Table 1**). There was no observed presence of antibodies to *Treponema pallidum* causing syphilis. Interestingly, the HBsAg seroprevalence in this finding is similar to a previous work from Portharcout, Nigeria which recorded a prevalence of 4.98% for HBsAg infection among blood donors [13]. On the contrary, a work from University College Hospital Ibadan, Nigeria showed the prevalence of HBsAg infection among blood donors to be 21.3% [14]. Although this present study recorded a lower rate than that obtained from the South Western Nigeria, certain factors may be responsible for the difference; age and locality. There is bound to be an increase when the youths who form the bulk of donors engage in indiscriminate sex as these infections are primarily sexually transmitted infections (STI). There is a marked predominance of male over female donors with a ratio of about 4:1. This is not surprising because females are usually limited by menstruation, pregnancy, breast feeding and child-bearing processes. There is bias regarding gender, increased deferral of female donors due to lower PCV or Hb value or a false sense of providing protection for women folk in our society amongst others. Counselling and orientation is needed in this regard, though this is not usually the case in developed countries. In the western world, the proportion of male to female one time whole blood donors was reported to be almost equal [15]. In our present study, females recorded negative for all the parameters screened (HIV, HBsAg, HCV and VDRL) (**Table 2**). Paid donors had the prevalence rate of 4.6%, 4.6% and 0.9% for HIV, HBsAg and HCV respectively. Family replacement donors had 1.9% for HCV while voluntary donors had 1% for HIV. The desire for money by the paid donors to maintain their lifestyle (sex and drugs) is a contributing factor that leads to the decision to become a commercial donor. It has earlier been reported that sex remains a major transmitter of viruses in these part of the world; hence

**Table 1:** Prevalence of transfusion transmissible infection (TTI) among blood donors in MUTH.

TTI	Positive donors	Negative donors	Total
HIV	6 (5.6%)	102 (94.4%)	108
HBsAg	5 (4.6%)	103 (95.4%)	108
HCV	3 (2.8%)	105 (97.2%)	108
VDRL	0	108 (100%)	108

extra care should be taken when it comes to blood from paid donors. The low incidence in voluntary donors could be due to the fact that they are probably aware of the TTI scourge. This does not mean that voluntary donors are not carriers but the prevalence is low as some may also be involved in indiscriminate sex and drug addiction [16] (**Table 3**).

**Table 2:** Distribution of transfusion transmissible infection among blood donors according to sex.

TTIs	Male		Female	
	Positive	Negative	Positive	Negative
HIV	6 (6.9%)	81 (93.1%)	0	21 (100%)
HBsAg	5 (5.7%)	82 (94.3%)	0	21 (100%)
HCV	3 (3.4%)	84 (96.6%)	0	21 (100%)
VDRL	0	87 (100%)	0	21 (100%)

**Table 3:** Prevalence of transfusion transmissible infection (TTI) in MUTH Elele based on source of donors.

Donor source	TTI positive			
	HIV	HBsAg	HCV	VDRL
Paid donors	5 (4.6%)	5 (4.6%)	1 (0.9%)	0
Voluntary donors	1 (1%)	0	0	0
FRD	0	0	2 (1.9%)	0
Total	6 (5.6%)	5 (4.6%)	3 (2.8%)	0

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Patients co-infected with HIV and HBsAg have a higher progression to hepatitis fibrosis and 3.5 fold increase in hepatic cirrhosis when compared with HIV alone [17]. From this research, only a patient was co-infected with both HIV and HBsAg (0.9%). Blood donor recruitment and retention are areas that need constant and changing attention to live up to the dynamism of the challenge to obtain enough blood to match the transfusion requirements. The threat to safety by seronegative individuals during the infectious window period should be seriously evaluated especially as a significant number of repeat donors have tested positive later. Look back techniques whereby facilities attempt to identify recipients of blood donated by individual donors who subsequently test positive for TTIs should be practiced [9].

## Conclusion

Blood donors in MUTH Elele are relatively safe but efforts should be intensified in ensuring maximum safety. This can be achieved by screening, counseling and creating awareness on the need to donate blood voluntarily. Voluntary and family replacement donors are safer than paid donors and hence paid donors should be discouraged.

## Conflict of Interest

We declare that we have no conflict of interest.

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