



ISSN: 0975-833X

Available online at <http://www.journalcra.com>

International Journal of Current Research
Vol. 12, Issue, 05, pp.11792-11794, May, 2020

DOI: <https://doi.org/10.24941/ijcr.38771.05.2020>

**INTERNATIONAL JOURNAL
OF CURRENT RESEARCH**

RESEARCH ARTICLE

PREVALENCE OF TRANSFUSION TRANSMITTED INFECTIONS IN VOLUNTARY BLOOD DONORS

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ARTICLE INFO

Article History:

Received 09th February, 2020
Received in revised form
14th March, 2020
Accepted 08th April, 2020
Published online 31st May, 2020

Key Words:

Physical Environment,
Learning Outcomes.

ABSTRACT

Globally, stakeholders in learning institutions have strived to improve the schools' physical environments in attempt to enhance learning outcomes of learners. The gist of this study was to establish whether the current status of the physical environment in the public secondary schools in Nairobi County have been mainstreamed to positively influence on the learning outcomes. The objectives of the study were: establish the extent of sufficiency of school land sizes; determine the status of schools land security of tenure; establish the status of maintenance of school buildings and; ascertain the adequacy of facilities for learning. The study adopted the case study research design. Public secondary schools were stratified into boys, girls and mixed categories. A further stratification along eight geopolitical divisions resulted into a sample of 39 schools. Results from a revised Commonwealth Association of Physical Environment (CAPE) questionnaire administered revealed that the overall average quality of mixed schools' index of 126 was lower than that of boys' and girls' schools. The indices for boys' and girls' schools were both equal to 134. A framework of improving school facilities from the foregoing results was, therefore, suggested with key features of upgrading old facilities, improve school grounds and controlling physical development around educational facilities

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Citation: Dr. Dantkale S.S., Dr. Pudale S.S., Dr. Swapnil Chandekar and Dr. Manasee Bendre. 2020. "Prevalence of Transfusion Transmitted Infections in Voluntary Blood Donors", *International Journal of Current Research*, 12, (05), 11792-11794.

INTRODUCTION

Transfusion of blood and blood components, as a specialized modality of patient management saves millions of lives worldwide each year. Globally, around 118 million units of donated blood are collected every year (WHO, 2014). Transfusion of blood and its components though life saving has life threatening hazards. With every unit of blood there is a 1% chance of transfusion associated problems including transfusion transmitted diseases. Transmission of infectious diseases through donated blood is of concern to blood safety as transfusion forms an integral part of medical and surgical therapy. Blood transfusion carries the risk of TTIs including HIV, hepatitis, syphilis, malaria, infrequently toxoplasmosis, brucellosis and some viral infection like CMV, EBV and herpes (Arora, 2010). TTIs are still a major concern to patients, physicians and policy makers who wish to seek risk free blood supply. As per guidelines of National AIDS Control Organization (NACO) of India, it is mandatory to test each and every blood unit for HIV, antiHCV, HBsAg, Syphilis and malaria (Sharma, 2014). The aim of the present study was to determine prevalence of TTIs in voluntary blood donors in transfusion service set up at a tertiary care hospital.

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MATERIALS AND METHODS

The present study was carried out in transfusion medicine department of tertiary care hospital over a period of 3 years. The voluntary donations primarily were obtained from walk in donors, students and employees of the institution and neighbouring colleges and outdoor blood donation camps. Donors were carefully selected after complete physical examination. Thorough clinical history was obtained from donors questionnaire (age, sex, occupation, previous donations). The blood samples from donors were tested for HIV (SD HIV ½ ELISA 3.0), HBsAg (ELISA Hepalisa J. Mitra & Co.), HCV (SD HCV ½ ELISA 3.0) and syphilis was tested with rapid plasma reagin method. Tests were performed according to the manufacturers instructions. Malaria was screened by preparing thick and thin blood smears. In our study, voluntary blood donation was 100% since last three years we have stopped donation from replacement donors.

RESULTS

A total number of 13916 donor blood units were screened for Transfusion Transmitted Infection over a period of three years. Majority of TTI positive blood donors belonged to young category from 18-35 years.

Table: Comparison of HIV , HBsAg, HCV and Syphilis seroprevalence among blood donors in different studies

Authors	HIV	HBsAg	HCV	VDRL
1. Singh et al.(2005)	0.54 %	0.62%	-	2.60%
2. Pahuja et al. (2007)	0.56%	2.23%	0.66%	-
3. Chatteraj et al.(2008)	0.13%	0.99%	0.19%	-
4. Chandra et al. (2009)	0.23%	1.96%	0.85%	0.01%
5. Arora et al. (2010)	0.3%	1.75%	1%	0.9%
6. Pallavi et al.(2011)	0.44%	1.27%	0.23%	0.28%
7. Gupta et al.(2011)	0.35%	1.66%	0.65%	2.8%
8. Giri et al.(2012)	0.07%	1.09%	0.74%	0.07%
9. Jasani et al.(2012)	0.25%	1.35%	0.16%	0.9%
10. Patel et al.(2013)	0.30%	0.85%	0.21%	0.25%
11. Lathamani et al.(2013)	0.8%	0.53%	0.09%	0.09%
12. Pathak et al.(2013)	0.25%	0.2%	0.7%	0.7%
13. Sethi et al.(2014)	0.19%	0.63%	0.2%	0.02%
14. Koshy et al.(2014)	0.27%	1.11%	1.53%	-
15. Manjunath et al. (2014)	0.27%	1.2%	0.9%	0.18%
16. Sacin et al. (2019)	0.08 %	1.1%	0.2 %	0.4%
17. Milind et al. (2019)	0.25%	1.05%	0.44%	0.05%
18. Present study	0.17%	2%	0.17%	0.11%

Male donors constituted 98.03% while 1.97% were female donors. The seroprevalence of HBsAg was 2% followed by HIV and HCV (0.17%) and syphilis (0.11%). No donors were found positive for malaria. In our study there was no co-infection between HIV and other infections.

DISCUSSION

Transfusion of blood and blood products is a boon to mankind and serves as a life saving measure. At the same time however, blood transfusion is an important mode of transmission of infection to the recipients. In developing countries the prevalence of TTI is much higher and quite far from attaining a zero risk level at the present moment. In present study, out of 13916 donors , the incidence of TTI was high in males as compared to females which is in accordance with the study done by Pallavi et al. (2011). Seroprevalence of HIV was 0.17% which was in concordance with studies done by Chatteraj et al. (2008) and Sethi et al. (2014). Considerable variation in the HIV prevalence is noted in different studies. This can be due to poor education and awareness levels, sexual promiscuity, intravenous drug abuse, low socioeconomic status, social customs such as piercing of ears, nose, using needles and non professional tattooing. Seroprevalence for HIV was higher among individuals with elementary educational level, daily workers. So there is need of comprehensive and targeted health education to enhance the awareness of community on the risk and mode of transmission of HIV (Yacob Tesfamichael Kleta, 2014). HBsAg seropositivity was found to be 2.23% blood donors, which was in comparison with the observations in the studies done by Chandra et al 8, Arora et al2. The high prevalence in our donors may be due to variation in population group under study.

Hepatitis C accounted for 0.17% seroprevalence. These findings were in accordance with the studies done by Jasani et al¹¹ and Chatteraj et al. The variation in hepatitis C seropositivity was due to differences in the donor base, variability in ethnicity and geography and different testing methodology. Seroprevalence of syphilis was 0.11% which is similar to the studies done by Manjunath et al. (Manjunath, 2014) (0.18%). Co-infection occurs because of similar transmission mode and the similar high risk population. Co-infection of HIV and hepatitis virus is common clinical problem. In the present study there was no co-infection between HIV and other infections.

Conclusion

Preventing the transmission of infectious diseases through blood transfusion in developing countries is difficult, given that the resources required are not always available even when policies and strategies are in place. These strategies have been extremely effective but transmission of diseases still occurs, primarily because of the inability of the test to detect the disease in the pre-seroconversion or 'window' phase of their infection, high cost of screening, lack of funds and trained personnel, immunologically variant viruses, non-seroconverting chronic or immuno silent carriers and inadvertent laboratory testing errors. Based on the results we feel that to reduce the risk of these infections non-remunerated repeat voluntary donor services need to be instituted. Extensive donor selection and stringing measures in donor screening can improve the blood safety. Voluntary blood donation has to be made a part of healthy lifestyle, enlightening the public about the benefits of voluntary blood donations. The major concern in transfusion services today is increased seropositivity for HCV, HIV, HBsAg and syphilis. If high sensitivity serological assays are not used; the safety of blood for transfusion may become a concern. The risk of transfusion transmitted infection cannot be eliminated completely even after mandatory testing of blood units because of risk associated with donation during window period. With the advent of advanced technology such as nucleic acid amplification techniques (NAT) for donor screening, western countries have decreased the risk of TTI to a major extent (Sacin Shivaji Kapse, 2019). New methods such as NAT, inclusion of Anti-Hepatitis B core antibody screening in blood donors and other infection markers would considerably improve the current screening procedure for blood donation. NAT has added benefits but its high financial cost is of concern, especially in economically restricted countries. Along with NAT, other factors such as public awareness, vigilance of errors, educational and motivational programs, help in decreasing the infection (Sacin Shivaji Kapse, 2019).

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