



ORIGINAL RESEARCH PAPER

Pathology

SEROPREVALENCE OF TRANSFUSION TRANSMITTED INFECTION IN BLOOD DONORS AT A TERTIARY HEALTH CARE CENTRE

KEY WORDS:

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INTRODUCTION:

- Blood safety begins with a healthy donor. Blood is a special form of natural fluid that is made and synthesized within the body and again used by the body for different bodily function.
- Blood transfusion is the most efficient way of transmission of HIV, HBV, HCV and Syphilis (VDRL). There is a challenge for safe transfusion requires the application of science and technology to blood processing and testing.
- Blood should be screened for presence of diseases causing viruses, bacteria or other microorganisms or for the presence of antibodies produced against these agents.
- The safety assessment of the blood supply, the quality of screening procedures and the risk of transfusion transmitted infectious disease in any country can be estimated by review and analysis of the records of blood donors, screening procedure and the prevalence of serological marker of infectious disease.

Aims of the study

This study was undertaken with the aim of determining the seroprevalence of Transfusion Transmitted Infection amongst voluntary as well as replacement blood donors at blood bank in tertiary care hospital.

Objectives of the study

- To estimate total number of healthy donors
- To find out age and gender wise seropositivity among them.
- To determine individual burden of transfusion transmitted infections among all the seropositive cases.

MATERIALS AND METHODS

- A study was carried out over a period from 1st June 2019 to 1st June 2022, in a blood bank at tertiary care hospital, Surendranagar.
- We determine among blood donors the seroprevalence of human immunodeficiency virus (HIV), hepatitis B surface antigen(HBsAg), hepatitis C (HCV), syphilis(VDRL) and malaria by donor type (voluntary/replacement), age and sex.
- Serum samples were screened for hepatitis B surface antigen (HBsAg), antibodies to human immunodeficiency virus (HIV) hepatitis c virus (HCV) using enzyme-linked immunosorbent assays with the third generation kits and syphilis using RPR test.
- And malarial parasites were screened by peripheral smear examination.

Table 1:Total number of donors

YEARS	GENDER		TOTAL NUMBERS
	MALE	FEMALE	
2019-2020	5907	117	6024
2020-2021	5152	85	5237
2021-2022	6458	146	6604
Total	17517 (98.05%)	348 (1.94%)	17865

Table 2: Distribution of seropositive blood donors by donor type and gender in year 2019-2022

Maximum no. of seropositive donors were replacement donors 130(56.51%), followed by voluntary blood donors 100(43.79%)

Years	Voluntary		Replacement		Subtotal		Total
	Male No.(%)	Female No.(%)	Male No.(%)	Female No.(%)	Male No.(%)	Female No.(%)	
2019-2020	28 (40.57%)	01 (1.45%)	39 (56.52%)	01 (1.45%)	67 (97.10%)	02 (2.89%)	69
2020-2021	36 (46.15%)	02 (2.56%)	40 (51.28%)	00 (0%)	76 (97.43%)	02 (2.56%)	78
2021-2022	32 (38.55%)	01 (1.20%)	49 (59.03%)	01 (1.20%)	81 (97.5%)	02 (2.40%)	83
Subtotal	96 (41.73%)	04 (1.73%)	128 (55.65%)	02 (0.86%)	224 (97.39%)	06 (2.60%)	230
Total	100 (43.47%)		130 (56.52%)		230		

Table 3: Age wise distribution of seroprevalence

Most common age group of reactive donors **21-30 years 96(41.73%)** followed by age group of 31-40 years 68(29.56%), 41-50 years 54(23.47%) while the **least age group 51-60 years 12(5.21%)**.

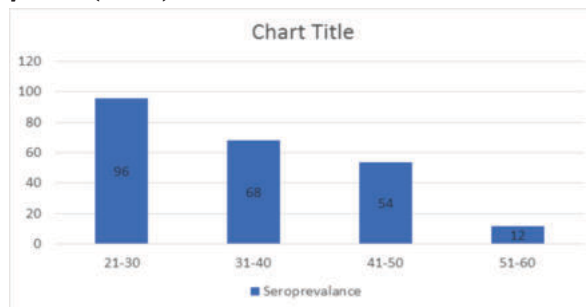


Chart 4: Gender wise distribution of seroprevalence Out of the 230 seropositive donors **Male 224(97.4%)** and **Female 06(2.6%)**

Table 5: Individual distribution of TTI among all donors Total seroprevalence of **syphilis** was 127 (0.71%) **highest** amongst followed by HBV 76(0.43%), HIV 18(0.10%) and HCV 09(0.05%)

Year	Number of donors	HIV	HBV	HCV	VDRL	MP	Total % seropositive
2019-2020	6024	03 (0.04%)	25 (0.41%)	04 (0.06%)	37 (0.61%)	00	69 (1.14%)
2020-2021	5237	07 (0.13%)	25 (0.47%)	04 (0.08%)	42 (0.80%)	00	78 (1.49%)
2021-2022	6604	08 (0.12%)	26 (0.39%)	01 (0.02%)	48 (0.73%)	00	83 (1.25%)
Total	17865	18 (0.10%)	76 (0.43%)	09 (0.05%)	127 (0.71%)	00	230 (1.28%)

Table 6: Distribution of syphilis from June 2019 to June 2022

Year	VDRL Positive
2019-2020	37 (0.61%)
2020-2021	42 (0.80%)
2021-2022	48 (0.73%)
Total	127 (0.71%)

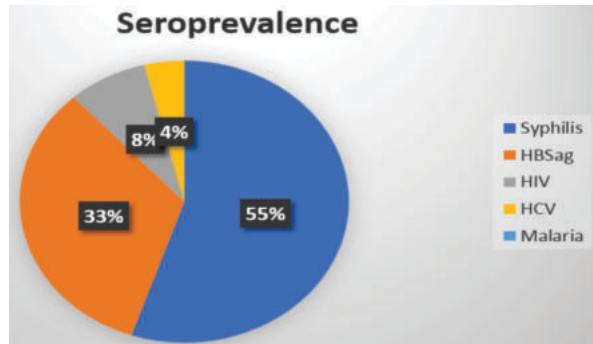


Chart 7: Total burden of the each individual TTI among all seropositive cases.

RESULT

- The present study was a recorded based on observational study carried out at the blood bank of a tertiary care hospital surendranagar. The study was carried on for a period of 3 years from June 2019 to June 2022. All the voluntary and replacement donors attending the blood bank were included in the study. Total **17865 (17517 male and 348 female)** blood donors were included in our study over a period of 3 years.
- According to types of donors **Voluntary** donors 100(43.46%) and **replacement** donors were 130(56.51%).
- The **most common** age group of reactive donors were found to be **21-30 years 96(41.73%)** followed by age group of 31-40 years 68(29.56%), 41-50 years 54(23.47%) while the **least** age group **51-60 years 12(5.21%)**.
- Gender wise distribution of seroprevalence- Out of the 230 seropositive donors **Male 224(97.4%)** and **Female 06(2.6%)**
- Of all the TTI, majority of the donors were found to be positive for **Syphilis 127 (55.21%)**, followed by **hepatitis B 76(33.04%)**, **HIV 18(7.82%)**, **hepatitis C 09(3.91%)** and case of malaria (0%).
- From our study we are seeing that prevalence of syphilis has significantly increased over the period of 3 years.

DISCUSSION

- Blood transfusion is an integral and life-saving procedure of modern medicine, but simultaneously it carries the risk of transmitting the life-threatening transfusion transmissible infections. HIV, hepatitis B, and hepatitis C are major public health problems in developing countries.
- Transmitted parenterally, vertically, or through high-risk sexual behaviors and can cause fatal acute and chronic life threatening disorders.
- In our present study we found that majority (97.04%) of donors were males which is in accordance to the studies done by **Suresh B et al (97.1%)**, **Yadav et al (98.38%)**, **Pahuja et al.**
- Majority of the donors were in the age group of 21-30 years which is similar to the study done by **Ahmed et al** who found that the majority of donors (69.8%) were in the age group of 20-30 years.
- In our present study we have found that percentage of TTI

to be (1.28%) which was compared to the study done by **Yadav et al** that prevalence of TTI to be (2.05%).

- In our study, the overall percentage of HIV, HBsAg, HCV and syphilis were 0.10%, 0.43%, 0.05% and 0.71% respectively, According to the study by **Pallavi et al**, overall prevalence of HIV, HBsAg, HCV and syphilis were 0.44%, 1.27%, 0.23% and 0.28%, respectively.

CONCLUSION

- Methods to ensure a safety blood supply should be encouraged. For that, screening with a better selection of donors and use of sensitive screening tests including nucleic acid technology should be implemented.
- Availability of safe blood for transfusion is a must for the recipients and the community as well. It may be possible through proper donor selection and education, uniform implementation of laboratory screening tests, and adequate supply of blood through voluntary blood donations along with restriction of donation by professional donors.
- Majority of the TTI were found in replacement donors only. More and more voluntary blood donors are needed which can be done by public awareness programmes, blood donation camps, restriction of donation by professional donors. With the advent of nucleic acid amplification techniques.

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