

## A Study To Estimate Proportion of Transfusion Transmitted Infections (TTI) In Voluntary Blood Donors of Prakasam District, Andhra Pradesh

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### Abstract:

**Context:** Significant blood loss is a medical emergency and providing safe blood for transfusion is a highly challenging responsibility vested on the blood bank services all over the world. In the 21<sup>st</sup> century due to unequivocal advancement of medical science in the field of hematology lead to effective screening of donor blood and deferral to prevent epidemics of life threatening Transfusion Transmitted Infection(s) (TTI) through unsafe blood transfusion. **Aim:** To estimate the proportion of TTIs in voluntary blood donors in Prakasam District.

**Methodology:** It is an institutional based observational study conducted using the secondary data of one year period (from April 2016 to March 2017) from blood banks of Prakasam District. Study conducted at RIMS, Ongole during the period from June 2017 to September 2017.

**Results:** A total of 13447 blood donors are screened for TTI and identified 340 blood samples had TTI (2.53%). Among the 340 TTIs 33(0.25%) are HIV cases, 217 (1.61%) are Hepatitis-B cases, 30 (0.22%) are Hepatitis-C cases, 11 (0.08%) are Syphilis cases and 49 (0.36%) are Malaria cases.

**Conclusion:** To ensure safe blood transfusion to recipients, need rigorous screening of blood donors and follow blood safety protocols.

**Keywords:** Blood Banks, Blood Donors, TTI (Transfusion Transmitted Infections), Blood Transfusion, Blood Loss.

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### I. Introduction

Global Population is on an exponential rise, Likewise the need for transfusion of blood. Replacement of blood is the only appropriate substitute for the management of blood loss. Injuries rank among top five list of cause of deaths in lower middle-income countries such as India and many of them need blood transfusion to prevent fatalities. In India, most common indications for blood transfusion being multiple injuries, surgeries, surgical management of pregnancy, hereditary hematological disorders and sepsis. Transfusion Transmitted infections (TTI) through donor blood is higher in India when compared to developed countries and poses an additional life threatening risk to the blood recipients. To ensure safe blood transfusion, screening for TTIs is vigorously undertaken all over the world as lessons learnt from the uneventful past viz; Transfusion related HIV transmission in 1980's and 90's. In India, blood bank services are provided by public and private funding. In Prakasam district, there are seven blood banks, to cater the needs of blood transfusion to an estimated population of 33,97,448 (India census 2011). Blood bank, located at RIMS medical college, and others. Present study is aimed at screening and deferral of blood of voluntary blood donors for TTIs such as HIV, HBsAg, HCV, Malaria and Syphilis in Prakasam District.

### II. Methodology

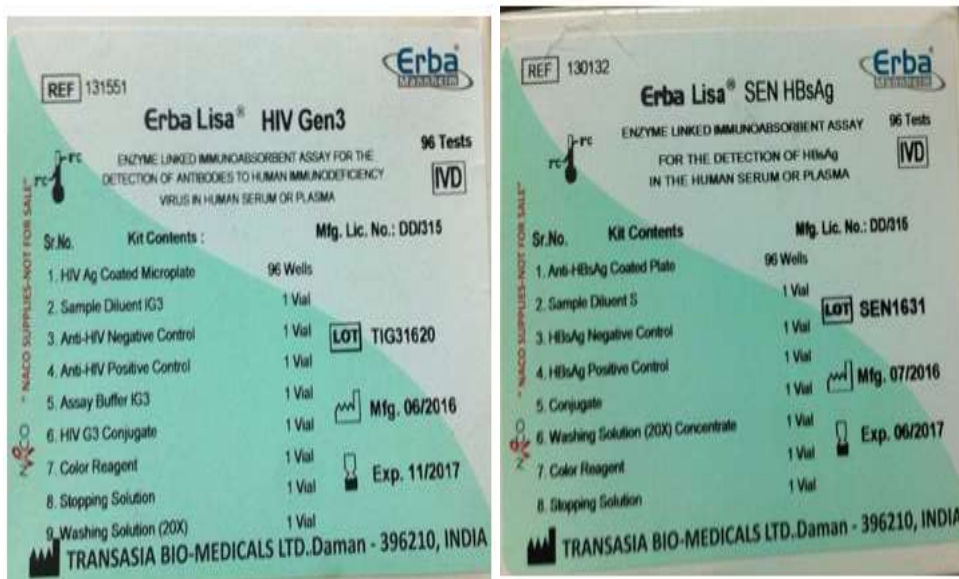
**Aim:** To estimate the proportion of Transfusion Transmitted infections(TTI) viz, HIV, Hepatitis-B, Hepatitis-C, Syphilis and Malaria among blood donors (voluntary, family/replacement) in Prakasam district.

**Objectives:** To estimate the proportion of blood samples having Transfusion Transmitted Infections among the total donated blood samples.

Present study is an observational study conducted at RIMS medical college during the period from June 2017 to September 2017. Every month census at blood banks is submitted in monthly reporting formats uploaded to naco-sims.nic.in website. We analyzed the secondary data collected from monthly and annual blood bank reports over a period of one year (from April 2016 – March 2017) from the office of the Additional District Medical and Health Officer (Addl.DM&HO) for HIV-AIDS and Leprosy, Prakasam District, responsible for monitoring and reporting of blood banks in Prakasam district. The study group comprised of apparently healthy volunteer blood donors of ages ranging from 18-25 years; with hemoglobin of at least 12.5 gm% are considered for blood donation. Donors less than 20 years or above 60 years of age; Donors with signs and symptoms of acute and chronic infections; subjects with ear piercing, dental extractions, tattooed within a month prior to blood donation; Donors with chronic cardio-pulmonary-renal-neoplastic-neurological diseases such as epilepsy, subjects with diabetes and other endocrine diseases, hemophiliacs, subjects with liver diseases, syncopal attacks and those with recent blood transfusion within six months were excluded from the study.

The collected donor blood is screened for TTIs through standardized protocol for screening donor blood and notifying the unhealthy donors of the respective TTIs and their referral to appropriate treatment facility. The TTIs Screened are chronic blood borne infectious diseases such as HIV determined by Erba Lisa HIV Gen3 test kit manufactured by Transasia Bio-medicals Ltd Daman, India which is an Enzyme linked Immunosorbent assay for the detection of antibodies to Human Immunodeficiency Virus in human serum or plasma, Hepatitis-B tested by Erba Lisa SEN HBsAg test kit manufactured by Transasia Bio-medicals Ltd Daman, India which is an Enzyme linked Immunosorbent assay for the detection of HBsAg in human serum or plasma, Hepatitis-C by Erba Lisa HCV test kit manufactured by Transasia Bio-medicals Ltd Daman, India which is an Enzyme Linked Immunosorbent assay for the detection of antibodies to Hepatitis C Virus in human serum or plasma, test for Syphilis is done by R.P.R Test Kit (modified slide test for Syphilis) manufactured by Beacon Private limited, Navsari, India and Malaria is tested by One step Test for Malaria Pf/Pv Ab/MERISCREEN Malaria NIU Ab test kit, Meril Diagnostic, Vapi, India. A retrospective analysis was done to estimate the proportion of blood samples having TTIs among the all collected blood samples during the period from January 2016 to December 2016.

**Figure No.1:** Label of HIV KIT Tested **Figure No.2:** Label of HBsAg KIT Tested



### III. Results

The data is collected from seven different blood banks in Prakasam district. A total of 13447 blood donors donated blood during the period 2016-2017 and all the donated blood samples are screened for TTI. Among all the donated blood samples, 340 (2.53%) blood samples had different TTIs. Table number.1 depicted that, among the seven blood banks NS-IRCS-ONGOLE PRAKASAM (4.02) showed high proportion of TTIs in donated blood samples followed by NS AH Markapur Blood bank (2.89) and NS AH Chirala Blood bank (2.63). The differences in the proportions of TTIs in seven blood banks are statistically significant (Chi-square = 35.833 with 6 degrees of freedom; P = 0.000). Chart number.1 showed the percentages of five different TTIs in the deferred blood samples. Among the 340 deferred blood samples having TTIs, Hepatitis-B cases (217, 64%) are more in number, followed by Malaria (49, 14%), HIV cases (33, 10%) Hepatitis-C cases (30, 8.8%), and Syphilis cases (11, 3.2%). Chart number.2 showed that, high proportions of HIV cases, Hepatitis C and Syphilis

cases are in NS-AH-Chirala blood bank, high proportion of Hepatitis B in NS-AH-Markapuram and high proportion of Malaria cases in NS-IRCS-ONGOLE PRAKASAM blood bank.

**IV. Discussion**

In Prakasam District, among the blood borne diseases tested two third of the cases are positive for Hepatitis-B and also show that the presence of endemic pockets of malaria in the general population as evinced in this study. In the erstwhile Andhra Pradesh, HIV prevalence is 0.9% and in the blood donors in Prakasam district is (0.25%) correlates with the study by Pahuja.S et.al, prevalence is less than the national averages per India, HIV estimates 2005, which is in decreasing trend in India;Hepatitis-B is 1.61%;Hepatitis-C is 0.22% Syphilis is 0.08%; malaria is 0.36% In the current study, The proportion of TTIs inPrakasam District in blood donors, Andhra Pradesh, India to high income countries, as follows., HIV is 83 times higher, Hepatitis-B is 53 times higher, Hepatitis-C is11 times higher, Syphilis is 1.6 times higher than High Income countries indicating the need of effective planning strategies to further reduce the TTI infectious and disease burden at local level.

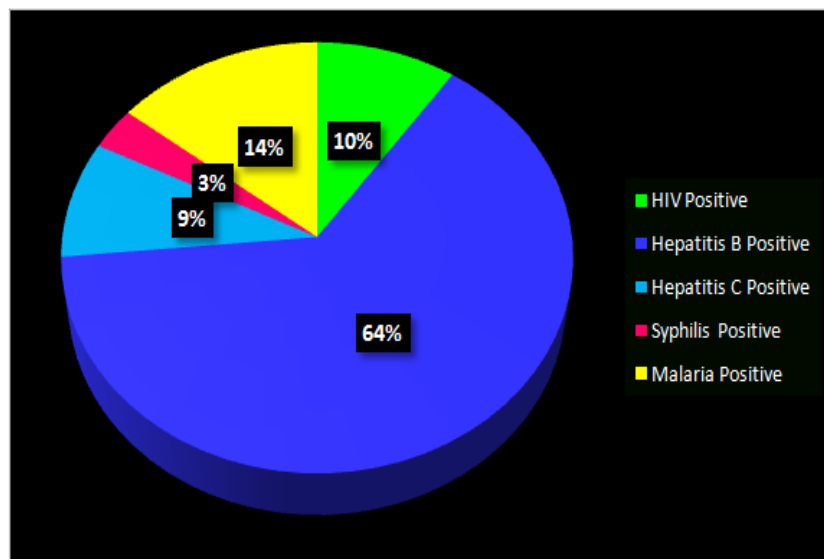
The proportion trends of TTIs observed in our study specifically do not conform with the seroprevalence trends in multiple studies conducted on blood donors in India and globally, reflecting changing diversity of socio-demographic, epidemiological changes in occurrence of the TTIs.

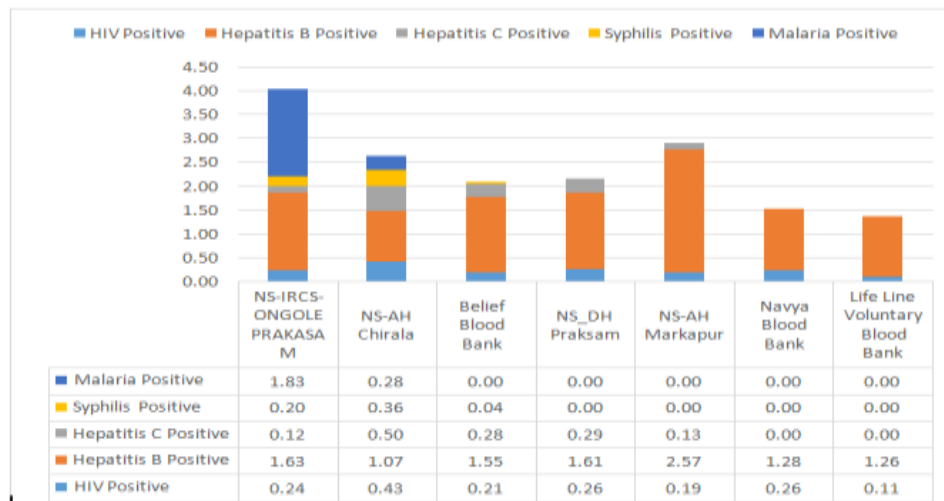
**V. Tables and Graphs**

**Table number 1.** Proportion of TTIs in collected blood samples during the period 2016-17 in Prakasam District

District Name	Total Blood Donations	HIV Positive	Hepatitis B Positive	Hepatitis C Positive	Syphilis Positive	Malaria Positive	Total test positives	Total test negatives	Proportion of TTIs
Belief Blood Bank	2830	6	44	8	1	0	59	2771	2.08
Life Line Voluntary Blood Bank	950	1	12	0	0	0	13	937	1.37
Navya Blood Bank	781	2	10	0	0	0	12	769	1.53
NS-AH Chirala	1405	6	15	7	5	4	37	1368	2.63
NS-AH Markapur	1554	3	40	2	0	0	45	1509	2.89
NS_DH Prakasam	3470	9	56	10	0	0	75	3395	2.16
NS-IRCS-ONGOLE PRAKASAM	2457	6	40	3	5	45	99	2358	4.02
Total	13447	33	217	30	11	49	340	13107	2.53

**Chart number 1.** Percentages of different TTIs in deferred blood samples in Prakasam district during the period 2016-17





**Chart number2.** Proportion of TTIs in seven different blood banks in Prakasam district during the period 2016-17

## VI. Conclusion

For every transfusion, there is a 1% risk of being infected with TTIs such as HIV, Hepatitis-B, Hepatitis-C, with lifethreatening consequences and remain infected for a life time except Malaria and Syphilis which are curable. Blood donors are invaluable to donate blood on voluntary, replacement basis. In the present study, the prevalence of transfusion Transmitted infections (TTI) is significantly higher than the global averages, which poses an increased risk to the needy recipients of blood and blood products. To check the spread of TTIs through blood transfusion from seropositive donors to recipients, it is mandatory to test the donor population. The effective implementation of screening donors must be done at all levels in health care delivery services in the general population. Strict universal precautions to be followed by the high-risk groups such as doctors, nurses, laboratory technicians while handling of blood and blood products and their safe disposal. In Prakasam district there are seven blood banks catering to the general population and are highly inadequate to support health care delivery system, there is an immense need to establish blood banks in addition to the existing ones. To prevent, control and reduce disease burden of TTIs in general population, awareness programs with periodical IEC campaigns are mandatory. In addition, Creation of e-blood donor registry at Local to National level under Public Private Partnership (PPP) will be of immense help in providing safe blood during transfusion emergencies. e-blood donor registry can be generated from existing national data bases such as Aadhaar in India after careful revision of privacy issues.

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