



## MALARIA SERO PREVALENCE IN THE BLOOD DONORS OF MALARIA ENDEMIC REGIONS OF THE COASTAL REGION OF ANDHRAPRADESH

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**ABSTRACT** Our study showed that the seroprevalence of malaria was more in Voluntary donors compared to replacement donors. However, a large sample is required to come to further conclusion. There should be a mechanism and education programs to increase the voluntary donation to supplement the increasing demand of blood and its products. With the implementation of strict donor selection criteria, use of sensitive screening tests, and establishment of strict guidelines for blood transfusion, it may be possible to reduce the incidence of TTI in Indian scenario.

**KEYWORDS :** Malaria, Blood, Donors, Seroprevalence, Transfusion

### Introduction:

Vector-borne diseases transmitted by blood transfusion are west Nile fever and malaria. Of these, Malaria continues to be one of India's leading public health problems. Transfusion-transmitted malaria occurs at an estimated rate of 0.25 cases per 1 million blood units collected.<sup>2</sup>

Transfusion malaria is fairly common in endemic areas. Following an attack of malaria, the donor may remain infective for years (1-3 years in *P. falciparum*, 3-4 years in *P. vivax*, and 15-50 years in *P. malariae*.) Most infections occur in cases of transfusion of blood stored for less than 5 days and it is rare in transfusions of blood stored for more than 2 weeks. Frozen plasma is not known to transmit malaria.<sup>3</sup>

Malaria can be diagnosed using RDT or Microscopy commonly. Rapid diagnostic tests (RDTs) for malaria are based on the detection of antigens derived from malaria parasites in lysed blood, using immunochromatographic methods. Most frequently they employ a dipstick or test strip bearing monoclonal antibodies directed against the target parasite antigens. The tests can be performed in about 15 minutes. Other diagnostic methods include microscopy using fluorochromes, polymerase chain reaction (PCR) based tests and antibody detection by serology but they are unsuitable for routine use.<sup>4,5</sup>

### Materials and Methods:

The present study was carried out in Blood bank of Great Eastern Medical School, Srikakulam from December 2016 to December 2017. The study was approved by Institutional Ethical Committee.

The blood bank of department of pathology, Great Eastern Medical School is licensed blood bank with average annual collection of 4000 units of blood from healthy blood donors from in and around Srikakulam annually.

**Inclusion criteria:** Any donor meeting all criteria's for eligibility of blood donation as mentioned in SOP, Blood Bank, Great Eastern Medical School, Srikakulam.

**Exclusion criteria:** Any eligible donor having any kind of reaction during the blood donation procedure was excluded from the study.

**Sample collection:** Two ml of blood sample was collected in labelled pilot tube at the time of collection of blood from donor tubing of blood bag. The sample was centrifuged at 3500 rpm for 5 minutes to obtain clear non haemolysed serum.

Test for malaria was done by rapid antigen detection test-PAN MALARIA CARD (J. Mitra & Co pvt Ltd, India), which is a visual, rapid and sensitive immunoassay for the qualitative diagnosis of infection with all four Plasmodium Species (*P. falciparum*/*P. vivax*/*P. malariae*/*P. ovale*) in human whole blood.

### Results:

**Table 1: Sero Prevalance of Malaria in Different Donors**

Donor Category	No of Blood Units Screened	No of Sero Positive Units	Percentage
Voluntary	478	2	0.42%
Replacement	3570	6	0.16%
Total	4048	8	0.19%

Table 1, shows seropositivity of malaria in different donor categories. Out of the 4048 blood donors, 3570 (88.19%) were replacement donors and remaining 478 (11.81%) were voluntary donors.

Of the total 4048 screened blood donors, eight units (0.19%) of the blood units were positive for malaria parasites. Of the positive units, 6 were from replacement donors and 2 were from voluntary donors. Out of 8 donors, 7 from rural area and 1 from urban area.

**Table 2: Age wise Distribution**

Age Range (yrs)	No of Sero Positives	Percentage
18-25	2	25%
26-35	4	50%
36-45	1	12.5%
46 and Above	1	12.5%
Total	8	100%

Table 2, shows age wise distribution of malaria positive donors. Maximum positive donors were 26-35 age group.

### Discussion:

**Table 3: Percentage of voluntary and replacement donors in different studies.**

AUTHORS	Voluntary donors (%)	Replacement donors (%)
Srikrishna et al <sup>6</sup>	1.5%	98.5%
Kakkar et al <sup>7</sup>	5.3%	94.7%
Singh et al <sup>8</sup>	15.5%	84.5%
Bhattachary et al <sup>9</sup>	94.6%	5.4%
Pallavi et al <sup>10</sup>	64.78%	35.22%
Present Study	11.81%	88.19%

Blood transmission is only one of the mode of transmission albeit a potential one, as other Transfusion transferred infections barring malaria can also be transmitted vide sexual contact, parenteral and vertical.<sup>15,16</sup> This point to the need for the use of more sensitive technique for screening of malaria to avoid post transfusion malaria particularly in pregnant women and immunodeficient patients in whom it is fatal.

In endemic area, it is recommended that chemoprophylaxis should be

given to all recipients since our study shows that seropositive donors are comparatively more in relation to non endemic areas.

It is also shown that replacement donors constitute the largest group of blood donors in India reflecting lack of awareness among the general population, the presence of misconceptions and fears associated with donating blood, the lack of health education and the indifference attitude of the health sector.

Table 3 shows, percentage of voluntary and replacement donors in different studies. In a study by Srikrishna et al (1999),<sup>6</sup> out of the total 8,617 screened blood units, none of the units were positive for malaria. Similar finding was noted by Sonawane et al (2003)<sup>11</sup> at Ambajogai.

Ghouzzi et al (2008)<sup>12</sup> studied the result of new ELISA malaria screening. The observed malaria prevalence was 0.05%. Hilda F. Etal<sup>13</sup> have reported 0.01% seropositivity among blood donors.

Chavan SK in their study have reported that over the last 10 years malarial infection has been negligible in the studied population. Prevalence of Malaria was low (0.002 %) with only one case being detected overall (in year 2013). No cases of Malaria were detected in other years (2004 to 2012).<sup>14</sup> Though globally malaria constitutes a big health problem in general population, the prevalence of malaria among the blood donors is low in most studies.

### Conclusions:

Our study showed that the seroprevalence of malaria was more in Voluntary donors compared to replacement donors. However, a large sample is required to come to further conclusion.

There should be a mechanism and education programs to increase the voluntary donation to supplement the increasing demand of blood and its products. With the implementation of strict donor selection criteria, use of sensitive screening tests, and establishment of strict guidelines for blood transfusion, it may be possible to reduce the incidence of TTI in Indian scenario.

### References:

1. Momoh ARM, Okogbo FO, Orhue PO, Aisabokhale FA, Okolo PO. Prevalence of blood pathogens among transfused patients in Ekpoma, Nigeria. *International J of comm res* 2013;2(4): 72-76.
2. Kumar A, Valecha N, Jain T, Dash AP. Burden of malaria in India: retrospective and prospective view. *The American journal of tropical medicine and hygiene* 2007;77(6):69-78.
3. WHO. BASIC MALARIA MICROSCOPY 2010. Available from [http://whqlibdoc.who.int/publications/2010/9789241547918\\_eng.pdf](http://whqlibdoc.who.int/publications/2010/9789241547918_eng.pdf).
4. Organization WH. New perspectives malaria diagnosis. The Organization; 2000. p. 12-3.
5. Organization WH. New perspectives malaria diagnosis. The Organization; 2000. p. 14-5.
6. Srikrishna A, Sitalaxmi S, Domodhar P. How safe are our safe blood donors?. *Indian J Pathol Microbiol* 1999; 42:411-416.
7. Chandra T, Kumar A, Gupta A. Prevalence of transfusion transmitted infections in blood donors: an Indian experience. *Tropical doctor* 2009;39(3):152-4.
8. Singh K, Bhat S, Shastry S. Trend in seroprevalence of hepatitis B virus infection among blood donors of coastal Karnataka. *Indian J Infect Dev Ctries* 2009;3:376-379.
9. Bhattacharya P, Chandra PK, Datta S, Banarjee A. Significant increase in HBV, HCV, HIV and syphilis infection among blood donors in West Bengal, Eastern India, 2004-2005. Exploratory screening reveals high frequency of occult HBV infection. *World J Gastroenterol* 2013;3730-3733.
10. Sawke N, Sawke GK, Chawla S. Seroprevalence of common transfusion-transmitted infections among blood donors. *People's journal of scientific research* 2010;3(1):5-7.
11. Sonawane BR, Birare SD, Kulkarni PV. Prevalence of seroreactivity among blood donors in rural population. *Indian J Med Sci* 2003;57:405-407.
12. Gouzzi MH, Beolet M, Banet V. Results of new ELISA malaria, screening in french blood bank. Impact on deferral rate in 2006-07. *Von Sang* 2008; 95:307.
13. Fernandes H, D'souza P, D'souza P. Prevalence of transfusion transmitted infections in voluntary and replacement donors. *Indian of Hematology and Blood transtision* 2010; 26(3) 89-91.
14. Chavan S.K, Chavan K.B. Seroprevalence, trend of transfusion transmittable infections and co-infections rate among blood donors at tertiary care hospital – 10 years study. *Int J Res Health Sci* 2014;2(4): 1014-1020.
15. Irshad M, Peter S. Spectrum of viral hepatitis in thalassemic children receiving multiple blood transfusions. *Indian J Gastroenterol.* 2002;21:183-4.
16. Mollah AH, Nahar N, Siddique MA, Anwar KS, Hassan T, Azam MG. Common transfusion-transmitted infectious agents among thalassaemic children in Bangladesh. *J Health Popul Nutr.* 2003;21:67-71.