

A Study for the Seroprevalence of Hepatitis-C Among Healthy Blood Donors, Patients Suffering from Chronic Liver Disease and High Risk Subjects

Pramendra Pachori^{1*}, Saroj Pachori², Geeta Pachori³, Aditi Sirohi⁴

^{1*}Associate Professor, Immunohematology and Transfusion Medicine, S.M.S Medical College, Jaipur, Rajasthan, India.

²Associate Professor, Department of Pathology, S.M.S Medical College, Jaipur, Rajasthan, India.

³Senior Professor and Head, Department of Pathology, JLN Medical College, Ajmer, Rajasthan, India.

⁴Senior Demonstrator, Department of Pathology, JLN Medical College, Ajmer, Rajasthan, India.

ABSTRACT

Aims and Objectives: To study the prevalence of hepatitis C virus (HCV) among healthy blood donors and in patients suffering from chronic liver disease and high risk subjects.

Materials and Methods: The study was conducted at the blood bank of SMS Hospital, Jaipur. The blood samples from following 1200 individuals were collected, 1000 consecutive healthy donors, 50 patients suffering from chronic liver disease, attend outpatient door (OPD) and indoor, cases of high risk subjects including 50 thalassaemia patients, 50 patients in haemodialysis units and 50 laboratory workers. These subjects were screened for hepatitis C virus by 3rd generation ELISA method.

Results: 1000 consecutive healthy blood donors were tested for anti HCV by third generation ELISA test. 200 high risk subjects including 50 cases of chronic liver disease, 50 cases of thalassaemia, 50 cases in dialysis unit and 50 laboratory workers were screened for anti HCV antibodies. Samples were collected at 0, 1, 3, 6 and 12 month interval. Most of the donors were replacement donors (92%) and majority of those were male (99.5%). Present study showed prevalence of anti-HCV antibodies 0.4 % in healthy blood donors, 4% in chronic liver

disease patient, 4% in thalassaemic patient, 2% in patients on dialysis.

Conclusion: The risk of HCV transmission by transfusion has been decrease by routine screening of donated blood along with donor screening and rejection of donor with high risk factor.

Keywords: Hepatitis, Blood Donation.

*Correspondence to:

Dr. Pramendra Pachori,
Associate Professor,
Immunohematology and Transfusion Medicine,
S.M.S Medical College, Jaipur, Rajasthan, India.

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INTRODUCTION

A Healthy person has healthy blood and healthy Hood can and does save life.¹ Blood transfusion can be source of infection to recipient. The important and largely preventable infection transmitted by blood are viruses, human immunodeficiency virus (HIV), hepatitis B virus (HBV), Hepatitis C virus (HCV) and delta virus (HDV), Human T cell lymphotropic viruses, cytomegalovirus (CMV) and Epstein Barr virus (EBV), bacterial infection syphilis and protozoal infection like malaria, toxoplasma and trypanosomiasis. Transfusion transmitted disease (TTD) is a major challenge to transfusion services all over the world.

According to World Health Organization, 3% of the world population is infected with HCV and around 170 million individuals are chronic carriers and at risk of developing liver cirrhosis and liver cancer.

In many countries, particular population subgroup such as voluntary blood donors have a high prevalence of HCV infection

specially in the developing countries. To ensure high standards of safety in transfusion products, The World Health Organisation (WHO) launched the global blood safety initiative (GBSI) in 1990.² In India the infections for which effective screening of blood products is currently mandatory are HIV, HBV, HCV, syphilis and malaria.³

Testing of donated blood for HCV has helped reduce the risk of transfusion associated hepatitis C from 10% to 01% in the industrialized countries.

Among volunteer blood donors, prior blood transfusion, intra nasal cocaine use, intravenous drug use, sexually promiscuity and ear piercing in men are risk factor for HCV infection. Voluntary blood donors who were tested positive for HCV were found to have history of blood transfusion in 27%, intranasal cocaine use in 68%, intravenous drug abuse is 42% and high risk sexual behaviour 53%.

Post Transfusion Hepatitis Risk Factor⁴:

- Source of blood Volunteer v/s paid donors
- Markers in blood HbsAg, ALT and anti HCV
- Number of units transfused
- High risk pooled plasma derivatives (factor VIII, IX concentrate).
- Hospitalisation

AIMS & OBJECTIVES

- To study the prevalence of hepatitis C virus (HCV) among healthy blood donors.
- To study the prevalence of HCV in patients suffering from chronic liver disease and high risk subjects including thalassaemia patients, patients in haemodialysis units and laboratory workers.

MATERIALS & METHODS

The study was conducted at the blood bank of SMS Hospital, Jaipur. This blood bank caters to the transfusion needs of hospitals attached to SMS Medical College and Govt. Hospitals in and around Jaipur district.

The blood samples from following 1200 individuals were collected, 1000 consecutive healthy donors, 50 patients suffering from chronic liver disease, attend outpatient door (OPD) and indoor, cases of high risk subjects including 50 thalassaemia patients, 50 patients in haemodialysis units and 50 laboratory workers. These subjects were screened for hepatitis C virus by 3rd generation ELISA method.

ELISA (HCV) microlisa: microwell ELISA test for detection of antibodies to hepatitis C virus in human serum/ plasma material.⁵

OBSERVATIONS

Table no. 1 shows that total numbers of donors included in study and the proportion of voluntary and replacement donors on them. A total of 1000 donors were screened. 920 (92%) re replacement donors while 80 (8%) were voluntary donors.

Table no. 2 shows the proportion of female and male donors among the voluntary and replacements donors. Out of 920 replacement donors 916 (99.5%) were male donors and 4 (0.5%) were female donor.

Table no. 3 shows the distribution of seropositive cases for anti-HCV antibody among voluntary and replacement blood donors. All the 4 seropositive case come from the pool of replacement donors. None of the voluntary donors showed anti-HCV Seropositivity. Anti HCV antibodies has a prevalence of 0.44%, out of 920 replacement donors and 0.4% among all donors.

Table no. 4 shows the distribution of all seropositive infected cases among voluntary and replacement donors with relation to sex. Although the replacement of female in donor population is very less 0.8% none of the females were seropositive for antibodies to HCV.

This table shows total number of high risk subjects included in this study. Out of 200 cases, 50 cases (25%) are chronic liver disease patients, 50 cases (25%) are thalassaemics, 50 cases (25%) are in dialysis units and 50 cases (25%) are laboratory workers. Majority of patients require chronic blood transfusion.

This table shows proportion of number of transfusion received by patients. In this study, majority of cases i.e. 85 patients (56.6%) had received 10-30 transfusion over a period of months to years, 12 patients (8%) had received more then 100 transfusion, 15

(10%) had received 70-100 blood transfusion, 14 patient (9.3%) had received 50-70 transfusion and 24 patients (16%) had received 30-50 transfusion.

Majority of cases who had received more than 100 transfusions belong to thalassaemia.

Out of the subjects none belonged to laboratory worker group.

Table 7 shows proportion male to female patient receiving multiple transfusions. Out of total 200 cases, 75.5% (151 cases) were males and 24.5% (49 cases) were females.

Table no. 8 shows distribution of seropositive cases for anti-HCV antibody in high risk subjects. In this study prevalence of anti-HCV antibody in chronic liver disease is 2/50 (4%) in thalassaemia patient it is 2/50 (4%) and in patient on dialysis it is 1/50 (2%) and zero in laboratory workers.

Table 1: Total no. of blood donors (n=1000)

Voluntary Donors	Replacement donors
80 (8.0%)	920 (92.0%)

Table 2: Total no. of blood donors (Sex ratio)

Voluntary Donors		Replacement Donors	
Male	Female	Male	Female
76 (95%)	4 (5%)	716 (99.5)	4(0.5%)

Table 3: Total no. of positive for antibodies to HCV (N=4)

Voluntary Donors	Replacement Donors
0	4

Table 4: Total no. of seropositive cases among voluntary and replacement donors with relation to sex distribution

Voluntary Donors		Replacement Donors	
Male	Female	Male	Female
0	0	4	0

Table 5: Total no. of high risk subjects (n=200)

High Risk Category	Total cases (200)
Chronic liver disease	50(25%)
Thalassaemia	50(25%)
Haemodialysis patient	50(25%)
Laboratory workers	50(25%)

Table 6: Numbers of transfusion received by patients

No. of transfusion	10-30	30-50	50-70	70-100	>100
Patients	85	24	14	15	12

Table 7: Proportion of male and female in high risk subjects

Total cases	Male	Female
200	151	49

Table 8: Total no. of cases positive for antibodies to HCV in high risk subjects

Chronic liver disease	2
Thalassaemia	2
Haemodialysis patients	1
Laboratory workers	0

DISCUSSION

This study was conducted in the blood bank, Department of Pathology, SMS Medical College and Hospital, Jaipur. 1000 consecutive healthy blood donors were tested for anti HCV by third generation ELISA test. 200 high risk subjects including 50 cases of chronic liver disease, 50 cases of thalassaemia, 50 cases in dialysis unit and 50 laboratory workers were screened for anti HCV antibodies. Samples were collected at 0, 1, 3, 6 and 12 month interval. Most of the donors were replacement donors (92%) and majority of whose were male (99.5%).

Present study showed prevalence of anti-HCV antibodies 0.4% in healthy blood donors, 4% in chronic liver disease patient, 4% in thalassaemic patient, 2% in patients on dialysis. In present study prevalence of anti HCV antibodies in healthy blood donor is 0.4%. Prevalence of anti-HCV antibodies among blood donors has been shown to be varying from 1.49% at AIIMS, New Delhi (Nanu A et al)⁶, 1.5% at AIIMS, New Delhi (Irshad M et al)⁷, 0.75% in South India (Chandrasekaran S et al)⁸, 0.76% at Mumbai (Menon M et al)⁹, 1.57% at New Delhi (Jain et al)¹⁰, 1.3% at Kerala (Mathai J et al)¹¹, 1.85% in AIIMS, Delhi (Pangrahi et al).¹² In present study prevalence of anti-HCV antibodies in chronic liver disease patients was 4%. These findings were correlated with other studies.

Prevalence of anti-HCV antibodies in chronic liver disease. Patients were 25.75% at New Delhi (Chakravarti A et al)¹³, 10.08% at New Delhi (Sarin SK et al)¹⁴, 13.83% at AIIMS (Pangrahi AK et al)¹², 47.2% in Egypt (Farid M et al)¹⁵, 40.8% in Pakistan (Khan TS et al).¹⁶ In present study the prevalence of anti-hepatitis C antibodies in haemodialysis patient is 4%. Prevalence of anti HCV antibodies in haemodialysis patient found to be 27.8% in Mumbai (Gosavi MS et al)¹⁷, 41.9% at Indore (Jaiswal SP et al)¹⁸, 46.2% in Egypt (Farid M et al)¹⁵, 20% in Spain (Esteban J.I. et al).¹⁹ In present study, the prevalence of anti HCV antibodies in thalassaemia patients is 2%. In study conducted at Indore prevalence of anti-HCV antibodies in thalassaemia receiving multiple blood transfusions was found to be 25.45%.¹⁸

In present study prevalence of anti HCV antibodies in laboratory worker is NIL. A study was conducted in Medicine, University of Miami School of Medicine, Emeryville, California. They determined the prevalence of antibodies to the hepatitis C virus (anti-HCV) in 90 patients and 37 staff members of 2 haemodialysis unit utilizing a recently developed anti HCV recombinant based assay. Eleven patients were anti HCV positive of these.

All multiple transfusions recipients should be properly followed up and should be investigated for transfusion transmitted disease so that as soon as we come to know about infection, patient is advised to contact physician to receive earliest possible treatment and avoid long term complication upto maximum possible extent.

SUMMARY & CONCLUSION

- The risk of HCV transmission by transfusion has been decrease by routine screening of donated blood along with donor screening and rejection of donor with high risk factor.
- Early notification of HCV infection could be beneficial to the recipient in that early treatment can be initiated and counseling can be provided to prevent secondary transmission.
- It is recommended that the recipient physician be promptly informed and affected patients be referred to an infectious disease specialist for monitoring, counseling and consideration of therapeutics intervention.

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