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RESEARCH ARTICLE

Seroprevalence of Anti-HCV Antibodies among Blood Donors in Local Population

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Abstract

(1) To determine the Seroprevalence of Anti-HCV Antibodies in the local population in and around Junagadh

Gujarat) from January-2011 to December-2014

(2) To compare the prevalence of seropositivity of Anti-HCV Antibodies with other regions in India

Materials and methods:

A retrospective study was conducted on blood donors over a period of 4 yrs to assess the prevalence of hepatitis C virus infection. Two different testing methods (1) rapid HCV card test (RECKON) and (2) Anti-HCV ELISA test (QUALISA-HCV) were used for screening purpose. First method was based upon the principle of Rapid Visual Single Step Immuno-chromatographic Assay and Second method was based upon the principle of ELISA.

Results:

A retrospective study was carried on 21,918 blood donors out of which 13,246(63.434%) were in-house donors and 8,672(39.566%) were outdoor (camp) donors .19,955 (91%) donors were male & 1,963(09%) donors were female. Out of 21,918 blood units collected, 1,121(5.115%) blood units were discarded. Out of 1,121 discarded units 18(1.606%) units were Anti-HCV reactive. The prevalence of Anti-HCV seropositivity was found to be 0.082%.

Conclusion:

Blood donors represent apparently healthy population of a particular geographical region. Occasionally out of them, some people are found to be reactive for Anti-HCV Antibodies and many other similar antigens as well as antibodies. So to reduce Seroprevalence of Anti-HCV, more sensitive screening assays and proper donor selection are must.

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INTRODUCTION

Hepatitis C is an acute or chronic necro-inflammatory disease of the liver, due to infection with hepatitis C virus (HCV) [1]. It continues to be a major disease burden in the world. In 1997, World Health organization (WHO) estimated a worldwide prevalence of about 3% with the virus affecting 170 million people worldwide and three to four million new infections each year [2]. Among the viral hepatitis, HCV is dreadful in the aspect that its morbidity rate is high as it establishes a state of chronic infection in as many as 85% of acutely infected patients whereas about 15% of acutely infected patients spontaneously clear the infection[3, 4].

The major clinical manifestation of chronic hepatitis C is progressive hepatic fibrosis, which leads to cirrhosis and increased risk of hepatocellular carcinoma [1]. The probability of cirrhosis occurring in 10-20 years after infection ranges from 5-25% [5] and probability of hepatocellular carcinoma after 20-30 years ranges from 0.7-1.3% of the cases [6].

The major risk factors for transmission of HCV are intravenous drug abuse, blood transfusion, sexual activity and hemodialysis [7]. It has been reported that more than 90% of seronegative recipients who are transfused with blood from HCV antibodies positive donors undergo seroconversion [8]. Thus, there is a high prevalence of HCV infection in multiple transfused thalassemic and hemophilic patients [9,10]. With the introduction of EIA (Enzyme Immunoassay) tests, the risk of transfusion transmitted hepatitis C has been substantially reduced [11]. Transmission may still occur rarely from donors with recent infections who have not developed detectable antibodies [12].

Materials and methods:

The study was conducted in the blood bank, Department of Pathology, GMERS Medical College, Junagadh. It is a retrospective study. A total of 21,918 units of blood were collected from donors (In-house & Outdoor-camp) from January 2011 to December 2014. They were carefully selected for donation after satisfactorily answering the donors questionnaire and passing the physical examination conducted by the physician-in-charge. All the blood samples were screened for Anti-HCV Antibodies using Two different testing methods (1) rapid HCV card test (RECKON) and (2) Anti-HCV ELISA test (QUALISA-HCV) for qualitative detection (screening) of Anti-HCV Antibodies in serum/plasma. All the tests were performed in accordance with the manufacturer's instructions with adequate controls.

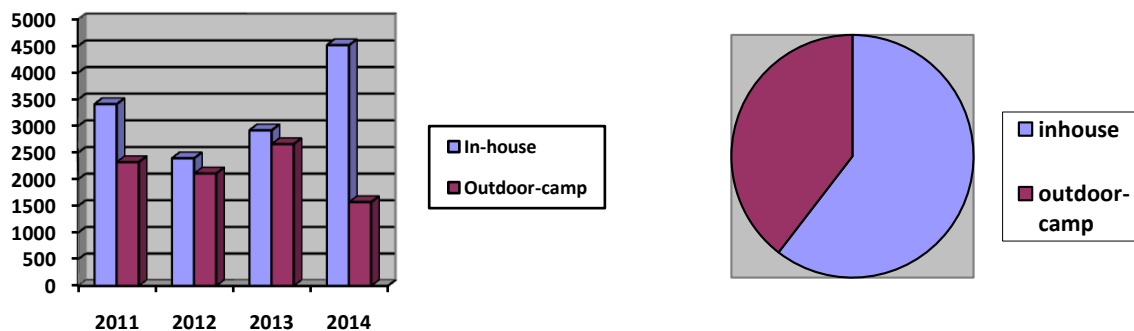
Results & Discussion:

A total of 21,918 donors were screened over a period of 4 yrs from January 2011 to December 2014, out of which **13,246(60.434%)** were in-house donors and **8,672(39.566%)** were outdoor (camp) donors. The year wise percentage is shown in the following table 1.

Table 1: trends in Outdoor-camp and In-house blood donation (Year-wise)

YEAR	TOTAL No. of Donors	No. of In-House Donors	Percentage of In-House Donors	No. of Outdoor-camp Donors	Percentage of Outdoor-camp Donors
2011	5736	3412	59.484%	2324	40.516%
2012	4507	2396	53.162%	2111	46.838%
2013	5583	2920	52.302%	2663	47.698%
2014	6092	4518	74.163%	1574	25.837%
TOTAL	21918	13246	60.434%	8672	39.566%

Figure1: trends in Outdoor-camp and In-house blood donation (Year-wise)

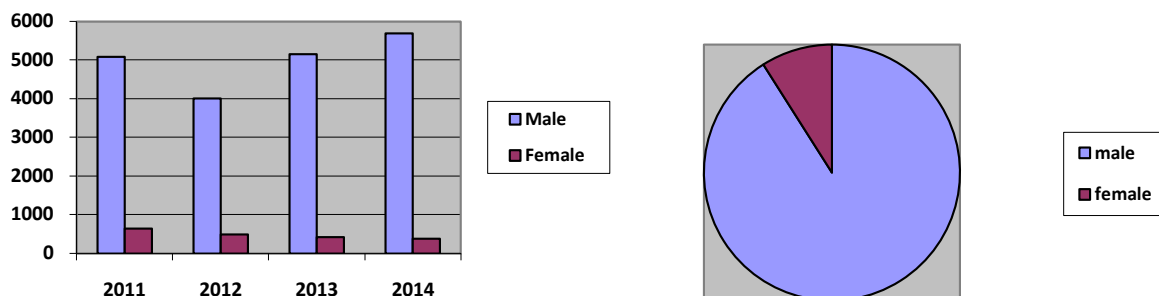


Out of 21,918 donors **19,955(91%)** were male donors and **1963(9%)** were female donors. The year wise percentage is shown in the following table 2.

Table 2: trends in Male & Female blood donation (Year-wise)

YEAR	TOTAL No. of Donors	No. of Male Donors	Percentage of Male Donors	No. of Female Donors	Percentage of Female Donors
2011	5736	5084	88.633%	652	11.367%
2012	4507	4017	89.128%	490	10.872%
2013	5583	5152	92.280%	431	7.720%
2014	6092	5702	93.600%	390	6.400%
TOTAL	21918	19955	91.00%	1963	09.00%

Figure 2: trends in Male & Female blood donation (Year-wise)



Out of 21,918 blood units collected, **1,121(5.115%)** units were discarded. Out of 1,121 discarded units **18(1.606%)** units were Anti-HCV reactive. The prevalence of Anti-HCV seropositivity was found to be **0.082%**. The year wise percentage is shown in the following table 3. The Year wise Percentage of Blood units discarded due to Anti-HCV Reactivity is shown in table 4.

Table 3: Incidence of Anti-HCV among donors during 2011-2014

YEAR	TOTAL No. of Donors	TOTAL No. of Bags Discarded	Percentage of Bags Discarded	TOTAL No. of Anti-HCV Reactive Units	Percentage of Anti-HCV Reactive Units
2011	5736	227	3.958%	4	0.070%
2012	4507	360	7.987%	10	0.222%
2013	5583	210	3.761%	2	0.036%
2014	6092	324	5.318%	2	0.033%
TOTAL	21918	1121	5.115%	18	0.082%

Table 4: Percentage of Blood units discarded due to Anti-HCV Reactivity during 2011-2014

YEAR	TOTAL No. of Bags Discarded	TOTAL No. of Anti-HCV Reactive Units	Percentage of Blood units discarded due to Anti-HCV Reactivity
2011	227	4	1.762%
2012	360	10	2.778%
2013	210	2	0.952%
2014	324	2	0.617%
TOTAL	1121	18	1.606%

Table 5: Comparison of Seroprevalence of Anti-HCV among Blood Donors in different studies

Name of Study	Month & Year	Place	Seroprevalence
S Sood et al [13]	April,2010	Jaipur,Rajasthan	0.28%
BK Das et al [14]	October,2011	Kolkata, West Bengal	0.32%
D Mehta et al [15]	February,2013	Jamnagar,Gujarat	0.26%

RN Makroo et al [16]	July,2013	New Delhi,India	0.39%
B Sethi et al [17]	August2013	Srinagar,Uttarakhand	0.20%
N Shah et al [18]	December,2013	Ahemadabad, Gujarat	0.108%
GA Dhruva et al [19]	April,2014	Rajkot, Gujarat	0.074%
Present study	December,2014	Junagadh ,Gujarat	0.082%

The overall prevalence of Anti-HCV seropositivity in blood donors in local population in our study was noted **0.082%** which is comparatively less than the other studies as mentioned above in table no.5 except noted in some recent studies like N Shah et al (**0.108%**) [18] & GA Dhruva et al (**0.074%**) [19] That suggests recent trends o Hepatitis C Seroprevalance in Gujarat.

Conclusion & Recommendations:

Blood donors represent apparently healthy population of a particular geographical region. Occasionally out of them, some people are found to be reactive for Anti-HCV and many other similar antigens as well as antibodies. So to reduce Seroprevalance of Anti-HCV, more sensitive screening assays and proper donor selection are must. Ensuring the safety of patients by reducing the residual risk of transfusion transmitted hepatitis is the concern of every transfusion center. Pre-donation counseling, donor self-exclusion and ensuring 100% voluntary blood donation will be effective in decreasing the hepatitis C infection rate. This study provides a helpful guide in reducing the residual risk of transfusion-transmitted hepatitis not only in India, but also in the other developing countries of the world.

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