JMSCR Vol||04||Issue||11||Page 13717-13721||November 2016

www.jmscr.igmpublication.org
Impact Factor 5.244
Index Copernicus Value: 83.27
ISSN (e)-2347-176x ISSN (p) 2455-0450
crossref DOI: https://dx.doi.org/10.18535/jmscr/v4i11.35

IGM Publication
Journal Of Medical Science And Clinical Research
An Official Publication Of IGM Publication

Prevalence of Hepatitis C among Voluntary Blood Donors in Mumbai

Authors
Dr Shilpa Laxmikant Narayankar[1], Dr Vikas Chandrahas Maindad[2]
[1]Assistant Professor, Grant Government Medical College, Mumbai INDIA
[2]Associate Professor, Grant Government Medical College, Mumbai INDIA

Abstract
Background: *According to WHO, 12 million Indians are suffering from hepatitis C. Prevalence of HCV in healthy blood donors represents prevalence of carrier state in the population. High rate of anti-HCV antibody (anti-HCV) positivity, which is seen in individuals who are transfused multiple times, is an indicator of risk of contracting HCV by blood transfusion [1].*
Methods: *All voluntary donors reporting to the blood bank were screened for HCV antibodies by using the appropriate enzyme-linked immunosorbent assay. The study was designed for duration of seven years between January 2008 to December 2014. Medical reports of the donors were accessed from the blood bank records and analyzed.*
Results: *A total of 5606 voluntary blood donors were screened, of which 5120 (91.33%) were males and 486 (8.67%) were females. The seroprevalence of Hepatitis C was 1.49%.*
Conclusion: Blood borne transmission of hepatitis C virus continues to occur despite implementation of highly sensitive screening tests for HCV, suggesting these assays are still not sensitive enough to prevent all infections.
Key words: *Hepatitis C, blood donors.*

Introduction

Globally 130–150 million people have chronic hepatitis C infection.

Approximately 500 000 people die each year from hepatitis C-related liver diseases [2]. Persistent HCV infection is associated with the development of liver cirrhosis, hepatocellular cancer, liver failure, and death, and HCV is now the most common cause of death in HIV-positive patients on highly active antiretroviral therapy [3.]

According to WHO, 12 million Indians are suffering from hepatitis C. Prevalence of HCV in healthy blood donors represents prevalence of carrier state in the population. High rate of anti-HCV antibody (anti-HCV) positivity, which is seen in individuals who are transfused multiple times, is an indicator of risk of contracting HCV by blood transfusion [1]. The present study was conducted to determine the prevalence of HCV antibodies in voluntary blood donors at a tertiary healthcare teaching hospital in Mumbai and to know the impact of a mandatory screening.

Methods

A retrospective hospital record-based study was conducted at the blood bank of a tertiary care

teaching hospital in Mumbai, India. The ethics committee of the institute approved the study. This research involves human participants and written consent was taken before blood collection. Data were collected for a period of 7 years from January 2008 to December 2014. Sera of voluntary blood donors from various localities and of different age groups was screened for HCV antibodies. A total of 5606 blood units were collected and studied. All voluntary blood donors were screened as per WHO criteria for blood donor selection. Five milliliter blood each was collected from subjects into plain, sterile tube following informed consent. Blood samples were centrifuged and the sera were separated and analyzed. Two kits were used based on WHO recommendation of two different testing strategies involving enzyme-linked immunosorbent assay (ELISA) and/or simple or rapid assays for surveillance. Samples were analyzed for antibodies to HCV, by ELISA. Any serum found reactive by the first assay was retested using a second assay based on different antigen preparations and/or different test principle using the anti-HCV test. The validity of the test is assured as per the given criterion and the results were computed.

Results

In the present study, out of total 5606 voluntary blood donors, 5120 (91.33%) were males and 486 (8.67%) were females which show predominance of males as compared to females for the seven studied years [Table 1]. The prevalence of Hepatitis C (1.49%) among voluntary blood donors in the study population is showed in [Table 2].

The highest prevalence of Hepatitis C (52.4%) was noted within the age group 21-30 years, followed by 20.23% within the age group 31-40 years, with the lowest prevalence observed within the age group of ≥20yrs [Table 3].

Sex distribution pattern of voluntary blood donors for Hepatitis C prevalence shown in [Table 4]. Prevalence of Hepatitis C is more in females as compared to males.

Table:1 Distribution of voluntary blood donors in the study population

Year	Total voluntary donors	Male	Female
2014	687	613 (89.2%)	74 (10.77%)
2013	1084	965 (89.035)	119 (10.97%)
2012	1024	934 (91.22%)	90 (8.780%)
2011	754	701 (92.98%)	53 (7.02%)
2010	438	413 (94.3%)	25 (5.70%)
2009	702	645 (91.89%)	57 (8.11%)
2008	917	849 (92.59%)	68 (7.41%)
Total	5606	5120 (91.33%)	486 (8.67%)

Table 2: Prevalence of Hepatitis C among voluntary blood donors in the study population

Year	Total no.of donors	Reactive for anti-HCV	
		Number	Percentage
2014	687	3	0.43%
2013	1084	18	1.66%
2012	1024	9	0.88%
2011	754	11	1.45%
2010	438	10	2.3%
2009	702	16	2.3%
2008	917	17	1.85%
Total	5606	84	1.49%

Table 3: Distribution of blood donors with anti-HCV according to the age

Age (years)	Reactive for anti-HCV	
	Number	Percentage
<20	1	1.19%
21-30	44	52.4%
31-40	17	20.23%
41-50	15	17.85%
51-60	7	8.33%
Total	84	100%

Table: 4 Distribution of blood donors with anti-HCV according to the sex

Sex	Reactive for anti-HCV	
	Number	Total Percentage
Males (5120)	76 (1.48%)	90.5%
Females (486)	08 (1.64%)	9.5%
Total (5606)	84 (1.49%)	100%

Discussion

Hepatitis C virus (HCV) is the main causative agent of post-transfusion hepatitis. The virus is distributed worldwide with prevalence varying from 0.2% up to 40% in different countries, which could easily lead to chronic infections, cirrhosis, and even hepatocellular carcinoma [4]. Higher HCV prevalence have been reported in Southeast Asian countries, including India (1.5%), Malaysia (2.3%), Philippines (2.3%), Pakistan (8.1%), and in equatorial Africa (6.5%), as high as 20% in Egypt[4].

In our study, the prevalence of Hepatitis C was found to be 1.49 %, while other studies like Giri et al[5](2012) 0.74%, Pandit et al[1] (2015) 0.21%, Meena et al[6] (2011) 0.57% noted lower prevalence. Our finding is in accordance with urban studies like Gupta et al [7] (2015)1.45%. HCV seropositivity in the western part of India has been reported between 0.34 to 2.5% and another study done in Hissar, Haryana, the seroprevalence of anti-HCV antibodies was 1%. A study done in Orissa reported anti HCV seroprevalence to be 1.98% [7]. The prevalence of hepatitis C in healthy blood donors was reported to be 1.09% in Punjab, 1.57% in Delhi, 0.75% in Madurai [8]. HCV Seroprevalence in Maharashtra among blood donors is 0.7% [1.] The seroprevalence rate of HCV among the blood donor population in India is 0.53 to 5.1% [7].

Prevalence of Hepatitis C was highest in the age group of 21-30yrs (52.4%) followed by 31-40yrs (20.23%) in our study. A study from Punjab reveals highest prevalence (49.81%) of Hepatitis C infection within the age group 41-60 years, followed by 30.04% within the age group 21-40 years, with the lowest prevalence was observed within the age group of years >80 (0.39%) and ≤20 (1.74%)[9]. While study from Delhi reported maximum seroprevalence of anti-HCV antibodies in the age group of 18 to 30 yr (0.41%) and the minimum in the age group of 51 to 60 yr (0.26%)[10].

Makroo et al [10] (2013) noted seroprevalence of anti-HCV antibodies in male blood donors was 0.38 per cent (n=750) while in female blood donors it was 0.36 per cent. In our study female donors (1.64%) showed high seroprevalence of anti-HCV antibodies compared to males (1.48%).

A study from Pune showed a zero percent prevalence in females [1]. Similar findings were reported from Andhra Pradesh and Orissa. A report from West Bengal showed 0.59% seroprevalence in female VBD[1]. Out of 104 countries which report to WHO, 18 countries receive less than 10% of the donations from females [1]. Lowest prevalence in females was observed in USA. But in all other studies, female VBD were very small in number and this prevented us from getting a

very correct idea about anti-HCV prevalence in female donors [1].

In the United States sero prevalence in HCV of blood donors was estimated to be 0.3 percent [10]. In Greece also a low prevalence (0.2 to 0.4%) of antibodies to HCV has been reported and a similarly low rate (0.13%) was also reported from Iran. Lower rates of anti-HCV antibodies have also been reported in blood donors of Turkey (0.07%), Saudi Arabia (0.4%), Mexico (0.84%) and Kenya (0.9%)[10] . HCV is globally distributed, with anti-HCV prevalence among donors ranging from 0.3 to 0.5% throughout the world [1]. The World Health Organization estimates that the world wide prevalence of HCV infection is approximately 3% [11].

The reported variation in the prevalence of anti-HCV antibodies among blood donors in different regions of the world may be attributed to the differences in the type, literacy rate and level of awareness among the blood donors [10]. Moreover, the differences in the testing methodology employed and the extent of its regulation may also have been the factors contributing to the observed differences [10].

In India, mandatory blood screening for HCV is done by serological tests for antibodies to HCV. The screened seronegative donations are still at risk for HCV and thus, need for a sensitive screening test arises to decrease this residual risk which has been reduced significantly over the last two to three decades in western countries where NAAT has been implemented [12]. It is essential to follow up the anti HCV reactive blood donors on two accounts, First for permanent deferral for blood donation and secondly for early management of HCV infection [7]. People with known HCV infection should be counseled regarding ways to reduce the risk of transmitting HCV to others, and means of minimizing their risk for HCV related complications [7].

Conclusion

As no vaccine is available and as the treatment is costly and lengthy, with a poor success rate, donor screening remains a very important means of primary prevention of HCV transmission. Transfusion safety begins with healthy donors. A fundamental part of preventing transfusion transmitted infections (TTIs) is to notify and counsel reactive donors. Donor notification and counselling protect the health of the donor and prevent secondary transmission of infectious diseases.

Compliance with ethical standards: The ethics committee of the institute approved the study.

Ethical approval: All procedures performed in studies involving human participants were in accordance with the ethical standards of the institutional and/or national research committee and with the 1964 Helsinki declaration and its later amendments or comparable ethical standards.

Written consent: written consent was obtained from all individual participants included in the study.

References

1. Pandit DP, MPP Chaudhury N. Prevalence of Antibodies to Hepatitis C Virus in Voluntary Blood Donors: Are Women Better Donors? J Clin Diagn Res. 2014 Apr; 8(4): DC20–DC23.
2. Who Hepatitis C.Fact sheet N°164Updated July 2015. http://www.who.int/-mediacentre/factsheets/fs164/en/
3. Messina JP, Humphreys I, Flaxman A, Brown A, Cooke GS, Pybus OG, and Barnes E. Global Distribution and Prevalence of Hepatitis C Virus Genotypes. Hepatology. 2015 Jan; 61(1): 77–87.Published online 2014 Jul 28.
4. Khodabandehloo M, Roshani D, Sayehmiri K. Prevalence and trend of hepatitis C virus infection among blood donors in Iran: A systematic review and meta-analysis. J Res Med Sci. 2013 Aug; 18(8): 674–682.
5. Giri P A, Deshpande J D, Phalke D B, Karle L B. Seroprevalence of

transfusion transmissible infections among voluntary blood donors at a tertiary care teaching hospital in rural area of India. J Family Med Prim Care. 2012 Jan-Jun; 1(1): 48–51.

6. Meena M, Jindal T, Hazarika A. Prevalence of hepatitis B virus and hepatitis C virus among blood donors at a tertiary care hospital in India: a five-year study. Transfusion. 2011 Jan;51(1):198-202.
7. Gupta S, Kumar R, Kaur A. Prevalence of Hepatitis C Virus Seropositivity among Blood Donors in a Tertiary Care Hospital. Int. Res. J. Medical Sci. February (2015) Vol. 3(2), 22-24.
8. Ramya SR , Kulkarni M. Hepatitis C Virus- Epidemiology and Genotyping. IOSR Journal of Dental and Medical Sciences (IOSR-JDMS) e-ISSN: 2279-0853, p-ISSN: 2279-0861.Volume 14, Issue 3 Ver. VIII (Mar. 2015), PP 29-34.
9. Singh P, Kaur R, Kaur A. Frequency distribution of Hepatitis C virus in different geographical regions of Punjab: Retrospective study from a tertiary care centre in North India. J Nat Sci Biol Med. 2014 Jan-Jun; 5(1): 56–58.
10. Makroo RN, Walia RS, Chowdhry M, Bhatia A, Hegde V, Rosamma NL. Seroprevalence of anti-HCV antibodies among blood donors of north India. Indian J Med Res. 2013 Jul; 138(1): 125–128.
11. Yeung CY, Lee HC, Chan WT, Jiang CB, Chang SW, Chuang CK. Vertical transmission of hepatitis C virus: Current knowledge and perspectives. World J Hepatol. 2014 Sep 27;6(9):643-51.
12. Hans R, Marwaha N. Nucleic acid testing-benefits and constraints. Asian Journal of Transfusion Science, Vol. 8, No. 1, January-June, 2014, pp. 2-3.