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TREND OF VIRAL (HBV, HCV& HIV) CO-INFECTIONS AMONG APPARENTLY HEALTHY BLOOD DONORS IN RANCHI, JHARKHAND.

Immunohaematology

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ABSTRACT

Context: Double or triple viral co-infections in apparently healthy blood donors might be more fatal than viral mono- infection.
Aim: To assess the trend of seroprevalence of double and triple viral co-infections among apparently healthy blood donors in Ranchi, Jharkhand.
Materials and Methods: All blood samples were screened for HIV-I and II, HBV and HCV by using chemiluminescence techanique.
Result: On screening of 57424 blood units, 1064(1.85%) donors were found positive for viral mono-infection (HBV,HCV& HIV). 14 (0.024%) donors showed double viral co-infections.
Conclusion: Apparently healthy blood donors might carry, life threatening, double and triple viral co-infections in their blood. Failure to diagnose and treat co-infection at an early stage results in serious complications and sequelae.

KEYWORDS

Transfusion transmitted viral mono and co-infections, HIV, HBV, HCV.

1.INTRODUCTION

The goal of any transfusion service must be to provide adequate and safe, blood and blood products to the recipients. With every one unit of blood transfusion there is 1% chance of transfusion related complications including transfusion transmitted infections[1]. Preventing transmission of transfusion transmitted infections through blood transfusion presents one of the greatest challenges of transfusion medicine [2]. The Drug and Cosmetic Act ,1945 (amended from time to time), all the blood donations are to be screened against the five major infections namely HIV I & II , HBsAg, HCV, syphilis and malaria[3,4]. NACO recommended 3rd or 4th generation ELISA HIV I & II test kits which are 100% sensitive should be preferred for use at blood banks for screening of donated blood [5] .Most of the studies world wide show majority of the blood donors are associated with viral **(HBV,HCV& HIV)** mono-infection but few studies also tell the truth of double viral co-infections among apparently healthy blood donors[6].The HIV-HBV or HIV-HCV co-infection has been reported worldwide, and some studies provide evidence that the rate of HBV is higher than that of HCV in HIV infected patients[7,8,9]. Hepatic diseases are one of the leading causes of morbidity and mortality in co-infected patients [10]. The aim of our present study was to know the prevalence of double viral co-infections among apparently healthy donors in Ranchi, Jharkhand.

2.MATERIALS AND METHODS

This is a retrospective study done at blood bank, RIMS, Ranchi from 1st March 2017 to 28th February 2019 (two years study). All blood samples were screened for HIV-I and II Ag/Ab (4th generation kit-Abott diagnostic), HBSAg and Anti-HCV(3rd generation kit -Abott diagnostic) by using chemiluminescence techanique (Manufacturer –Abbott, Model-Architect i 1000SR). Test results were taken in relative light units(RLUs).Blood units showing result 1.0 RLU or more as well as grey zone results (0.90 to 0.99) were considered as positive for corresponding infection.

3.RESULTS

From March 2017 to 28th February 2019 a total of **57424** blood units were screened in which **1064(1.85%)** donors were found positive for one of the viral infections **(HBV,HCV& HIV) Table-01 .** Highest prevalence was for **HBV (572 donors –0.99%)** followed by **HCV(326donors -0.74 %)** and **HIV (66 donors -0.11 %)**. 10 donors showed double viral co-infections with **HBV and HCV** , **03** donors showed double viral co- infections with **HBV and HIV** and **01**donor showed double viral co- infections with **HCV** and **HIV (Table-02)**. **Table -03 ,Table-04 and Table -05** showed test results in relative light units (RLUs) of double viral co-infections of **HBV and HCV ,HBV and HIV** as well as **HCV** and **HIV** respectively.

Table 01 : Percentage of Transfusion Transmitted Viral Mono-infection Among Blood Donors From 01.03.17 to 28.02.19

S.N	Time period	Total no of blood units screened	Total no of HBV mono-infection	% of Total no of HBV mono-infection	Total no of HCV mono-infection	% of Total no of HCV mono-infection	Total no of HIV mono-infection	% of Total no of HIV mono-infection
1	1.03 17 to 31.12.17	24298	230	0.40	186	0.32	27	0.047
2	01.01.18 to 31.12 .18	28905	294	0.51	211	0.36	37	0.064
3	01.01.19 to 28.02.19	4221	48	0.083	29	0.050	2	0.0034
	Grand Total	57424	572	0.99	426	0.74	66	0.11

Table 02: Percentage of Transfusion Transmitted Viral Co-infections Among Blood Donors From 01.03.17 to 28.02.19

S.N	Time Period	Total no of HBV & HCV co-infections	% of total no of HBS & HCV co-infections	Total no of HBS & HIV co-infections	% of total no of of HBS & HIV co-infections	Total no of HCV& HIV co-infections	% of total no of HCV& HIV co-infections
1	01.03 17 to 31.12.17	05	0.0087	02	0.0034	01	0.0017
2	01.01.18 to 31.12.18	03	0.0052	01	0.0017	Zero	Zero
3	01.01.19 to 28.02.19	02	0.0034	Zero	Zero	Zero	Zero
	Grand Total	10	0.017	03	0.0052	01	0.0017

Table 03 :-Test Results of Blood Units Having Double Viral Co-Infections Of HBV And HCV In Relative Light Units (RLUs) from 01.03.17 to 28.02.19

S.N	Date	Annual Bag No	Age	Sex	Result of HBSAgQ2 in RLUs	Result of Anti-HCV in RLUs
1	27.03.17	5888	32	M	5011.27	5.63
2	23.04.17	7788	19	M	481.12	6.63
3	18.07.17	14431	28	M	5949.45	1.94
4	01.08.17	15408	22	M	5171.32	1.41
5	17.10.17	21939	21	M	5261.20	3.91
6	05.0418	6568	25	M	0.92	1.45
7	17.06.18	12270	28	M	4031.43	1.75
8	11.10.18	22330	35	M	5780.09	3.15
9	09.01.19	422	22	M	556.52	4.80
10	07.02.19	2625	33	M	3268.03	2.11

Table 04 :-Test Results of Blood Units Having Double Viral Co-Infections of HBV And HIV In Relative Light Units (RLUs).

S.N	Date	Annual Bag No	Age	Sex	Result of HBSAgQ2 in RLUs	Result of HIVAg/Ab in RLUs
1	10.10.17	21476	35	M	4090.88	851.37
2	24.12.17	27664	34	M	3871.01	1.95
3	23.10.18	23511	42	M	1059.38	1031.79

Table 05 :-Test Results of Blood Units Having Double Viral Co-Infections of HCV And HIV In Relative Light Units (RLUs).

S.N	Date	Annual Bag No	Age	Sex	Result of anti HCV in RLUs	Result of HIVAg/Ab in RLUs
1	30.03.17	6150	22	M	1.70	2.28

4.DISCUSSION

Human immunodeficiency virus (HIV), Hepatitis B virus (HBV) and Hepatitis C virus (HCV) are the three most common chronic viral infections documented worldwide[11,12]. It is estimated that more than 33 million people are infected with HIV worldwide[13]. Approximately 20% of HIV-positive patients who acquire acute HBV infection develop chronic HBV infection compared to only 5% of HIV-negative persons [14]. It is observed that, those HIV infected individuals who are co-infected with hepatitis viruses display rapid progression to severe liver disease and have an increased risk of hepatotoxicity associated with anti-retroviral therapy [15]. Failure to diagnose and treat co-infection at an early stage results in serious complications and sequelae[6].In US and Europe, HIV and HBV co-infection was reported to be 6 to 14 % while reports for HIV and HCV varied in the range of 25 to 50 % [8, 15]. In India the overall rate of infection with HBV and HCV varies from 1– 6% [16,17,18]. The rate of HBV and HCV co-infection in HIV patients has been reported in few studies in Nepal [15,19]. Ghimire P et al. found co-prevalence of HBV/HIV in Nepal to be 0.033%[15] and Surendra Karki et al reported co-infection rate of 10.8%) for HCV / HIV in the blood donors [19] respectively which was higher than our study. HBV co-infections in female patients were more prevalent than in their male counterpart [7]. but in our study all the HBV co-infected individuals were male and the commonest age group affected was 20 to 30 years of age.

5.CONCLUSION

For Safe blood transfusion all blood units should be tested for compatibility and TTI's with reduction in unnecessary blood transfusion. Apparently healthy blood donors might carry, life threatening, double viral co-infections in their blood. Failure to diagnose and treat co-infection at an early stage results in serious complications and sequelae.

6.Declarations

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Conflict of interest: None
Ethical approval: Not required

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