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Original Article

Seroprevalence of Hepatitis G Virus IgG Antibody among Blood Donors, Pregnant Women, Neonates and Apparently Healthy Population

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Abstract :

This cross sectional and observational study was conducted in the Department of Microbiology, Sylhet MAG Osmani Medical College, Sylhet, during the period from 1st January 2012 to 31st December 2012 with a view to explore the seropositivity of Hepatitis G virus (HGV) in blood donors, pregnant women, new born and apparently healthy subjects. For this purpose 45 blood donors, 45 pregnant women, 45 new born babies of same mothers and 45 apparently healthy subjects were selected according to the inclusion and exclusion criteria. The HGV antibody was measured in venous blood from blood donor, pregnant women and apparently healthy subjects; and cord blood from newborn babies with a commercially available enzyme-linked immunosorbent assay (ELISA) method. The mean age of the blood donors, pregnant women and healthy subjects was 24.9 (SD±3.5) years; 24.9 (SD±3.5) years and 22.1 (SD±1.5) years respectively. The overall seropositivity of HGV was 3 (1.7%). The seropostivity of HGV of blood donors, new born babies and healthy subjects was 1 (2.2%) in each group but no HGV antibody positivity among the pregnant women (p=0.797). Among the male patients 2 (2.2%) patients were seropositive for HGV; while in female patients, 1 (1.1%) patient was seropositive for HGV (p=0.547). Among the patients with previous blood transfusion 1 (1.9%) patient was seropositive for HGV; while among patients without previous blood transfusion 2 (1.6%) patients were seropositive for HGV (p=0.882). This study yielded that there is high prevalence of HGV seropositivity among population in this region of Bangladesh. So, screening of blood units for HGV would deserve consideration.

Key words : HGV, blood donor, pregnant women, apparently healthy subjects, newborn babies.

Introduction :

Hepatitis G virus (HGV), was discovered by two independent groups of investigators in the study of cases of hepatitis non-A, non-B, non-E[1,2]. The discovery of this new viral agent associated with liver diseases has attracted considerable attention due to the fact that there are hepatitides of unknown etiology[3]. In 1966, the 34-year-old surgeon G. Barker (GB) fell ill with acute hepatitis of moderate enzymatic activity and three-week icteric period. Patients blood taken on icteric day 3 was used for intravenous inoculation of nonhuman primates (bare-faced marmosets, the Callithricidae family). Hepatitis was recorded in all animals when four monkey-to-monkey passages were performed. The findings suggested that the cause of this hepatitis was a yet unidentified viral agent that was named GBV[3]. The genome of the virus is represented by single-chain RNA with positive polarity. The GBV-C genome is similar to hepatitis C virus (HCV) RNA in its organization, i.e. the structural genes are located at the genomic 5' region and non-structural genes are at the 3' end[3,4].

The prevalence of GBV-C infection in the general population is higher than that of other blood borne viruses[5] and can be transmitted parenterally, sexually and vertically[5,6]. GBV-C, like other parenteral hepatitides viruses, occurs universally, but non-uniformly[3,7-11]. Analysis of the results of examining 13,610 blood donors described in thirty reports revealed viral RNA in 649 (4.8%) of cases. These included

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Caucasians (4.5%), Asians (3.4%), and Africans (17.2%)[12]. Mother-to-child transmission (MTCT) of GBV-C has been hypothesized as one possible mechanism for the relatively high prevalence of GBV-C infection in the general population[11,13]. Among antenatal populations, the prevalence of GBV-C RNA varies from 1%-2% in East Asia[14,15] to 5%-7% in Europe, Australia, and Southeast Asia[11,16-17] and 10%-13% in Africa [18,19].

The basic marker used to diagnose GBV-C is RNA that is detectable by the amplification technique with a preliminary stage of reverse transcription in which cDNA is synthesized [reverse-transcriptase polymerase chain reaction (RT-PCR)[3]]. GBV-C RNA has been detected in hepatocytes[3,20] peripheral blood lymphocytes and monocytes, vascular endothelial cells and other tissues[3].

No previous study regarding the HGV seropositivity was done in Sylhet MAG Osmani Medical College Hospital. So, this study was designed to explore the sero-prevalence of HGV among different population in Sylhet MAG Osmani Medical College Hospital.

Materials and Methods :

This cross sectional and observational study was conducted in the Department of Microbiology, Sylhet MAG Osmani Medical College, Sylhet during the period from January 2012 to December 2012. All blood donors those attended the Department of Blood Transfusion, pregnant women attended the Department of Obstetrics and Gynaecology, Sylhet MAG Osmani Medical College Hospital, Sylhet and their new born babies; and apparently healthy subjects were the target population. Study population was determined who fulfilled the drietly mention. Ethical issues were maintained properly. Informed written consent was taken from each of the participants. Study populations were grouped into four, namely Group-A (45 blood donors) Group-B (45 pregnant women) Group-C (45 new born babies of same mothers) and Group-D (45 apparently healthy subjects). Venous blood was collected from the study population after aseptic precaution. The samples were processed immediately at room temperature by centrifugation and serum was separated followed by storing at -20ºC until further analysis. Serological analyses were carried out in the Department of Microbiology, Sylhet MAG Osmani Medical College, Sylhet. HGV antibody was measured with a commercially available enzyme-linked immunosorbent assay (ELISA) method using HGV ELISA Kit (Enzo Diganostics Inc, Immuno Ditek, New York, USA).

Results :

The age of the blood donors and pregnant women had the same scenario where the ranged from 20 to 30 years with the mean age of 24.9 (SD ± 3.5) years. The age of the healthy subjects ranged from 20 to 28 years with the mean age of 22.1 (SD ± 1.5) years.

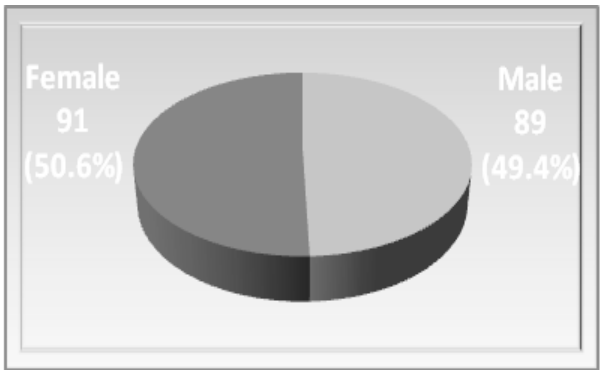

Figure 1: Distribution of study population according to sex (n=180)

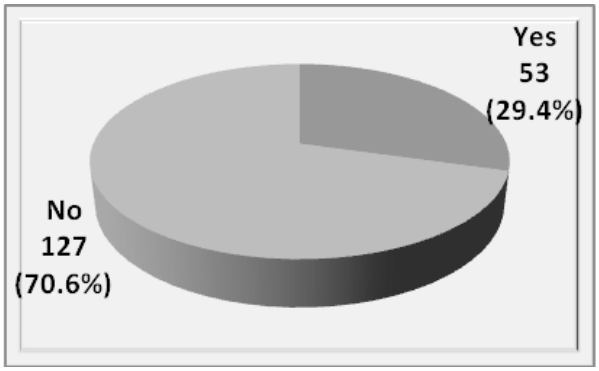

Figure 2: Distribution of study population according to previous blood transfusion (n=180)

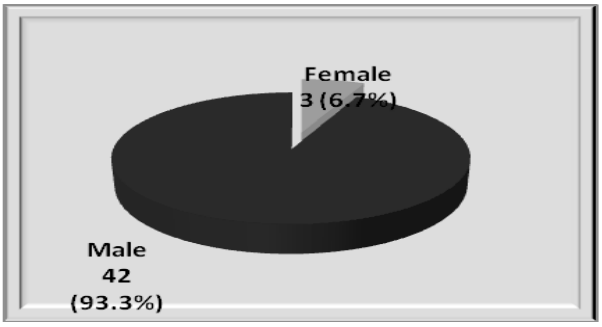

Figure 3: Distribution of blood donors by sex (n=45)

Table I: Distribution of seropositivity of HGV according to different groups

Different groups	Seropositive	Seronegative
Blood donors (n=45)	1 (2.2)	44 (97.8)
Pregnant women (n=45)	0 (0.0)	45 (100.0)
New born babies (n=45)	1 (2.2)	44 (97.8)
Healthy subjects (n=45)	1 (2.2)	44 (97.8)
p-value	p=0.797	

Table II : Distribution of seropositivity of HGV according to sex and previous blood transfusion

Serology	Sex			Previous blood transfusion		
	Male (n=89)	Female (n=91)	p-value	Yes (n=53)	No (n=127)	p-value
Seropositive	2 (2.2)	1 (1.1)	p=0.547	1 (1.9)	2 (1.6)	p=0.882
Seronegative	87 (97.8)	90 (98.9)		52 (98.1)	125 (98.4)	

Discussion :

This cross-sectional study was conducted in the Department of Microbiology, Sylhet MAG Osmani Medical College, Sylhet during the period from January 2012 to December 2012 with a view to explore the seropositivity of HGV infection in blood donors, pregnant women, new born and apparently healthy subjects.

In this study, the age of the blood donors ranged from 20 to 30 years with the mean age of 24.9 (SD ± 3.5) years; the age of the pregnant women ranged from 20 to 36 years with the mean age of 24.9 (SD ± 3.5) years; and the age of the healthy subjects ranged from 20 to 28 years with the mean age of 22.1 (SD ± 1.5) years. Handajani et al[21] performed a study with similar objectives included 150 for healthy blood donors with mean age of 36.3 years; age range, 18 to 58 years. In the present study 42 (93.3%) were male and 3 (6.7%) were female among the blood donors; 26 (57.8%) were male and 19 (42.2%) were female among the new born babies; and 24 (53.3%) were male and (46.7%) were female among the healthy subjects. Handajani et al[21] reported 143 (93.3%) males and 7 (6.7%) females was yielded in 150 healthy blood donors.

Among the study population in the current study 3 (1.7%) respondents were seropositive for HGV and rest 177 (98.3%) respondents were seronegative for HGV infection. In this regards Siddiqua et al[22] reported the overall prevalence of HGV antibody was 3.2% in a study conducted in Bangabadhu Sheikh Mujib Medical University, Dhaka, which was little high from the present study and may be due to inclusion of commercial sex workers in their study.

In this study, seropositivity of HGV in blood donor was 2.2%. This result was supported by Blair et al[23] that 2.25% of non-remunerated blood donor population of 1020 regular blood donors in Edinburgh and Southeast Scotland Blood Transfusion Service center were positive for plasma HGV/GBV-C RNA. In the present study no pregnant woman was seropositive for HGV. This result was different from the other studies that among antenatal populations, the prevalence of GBV-C RNA varies from 1%-2% in East Asia[14,15] to 5%-7% in Europe, Australia, and Southeast Asia[11,16-17,] and 10%-13% in Africa[18,19], and can be transmitted parenterally, sexually, and vertically[6]. This may be due to small number of sample in this study.

In the current study, 2.2% of new born baby was seropositive for HGV infection. Mother-to-child transmission (MTCT) of GBV-C has been hypothesized as one possible mechanism for the relatively high prevalence of GBV-C infection in the general population[11.13].

In this study, 2.2% of healthy subject was seropositive for HGV infection. Anti-HGV antibody was detected about 3 to 20 % of healthy people, indicating that the virus is more widely spread among the general population worldwide. In particular, rates of HGV seropositivity have ranged between 2-8% in Asia and North America, between 10-15 % in Europe and around 20% in South Africa and South America [22,24].

In the currents study, seropositivity did not differed among the blood donor, pregnant women, new born babies and apparently healthy subjects (p=0.797). This may be due to small sample size. It were interesting that one (2.2%) new born baby was found seropositive to HGV infection. The mother of whom were seronegative (the titer was nearer to seropositivity). The reason for this sero-discordance is not clear. This may indicate that transmission was occurred during the pregnancy and maternal titre fall but new born titre persist.

In the present study, among the patients with previous blood transfusion 1 (1.9%) patient was seropositive for HGV; while among patients without previous blood transfusion 2 (1.6%) patients were seropositive for HGV. Seropositivity did not differed between previous blood transfusion and no previous blood transfusion (p=0.882). Siddiqua et al[22] reported none of the 62 multiple transfused patients had antibody to HGV.

In this study, among the male 2 (2.2%) patients were seropositive for HGV; while in female 1 (1.1%) patient was seropositive for HGV. Seropositivity did not differed between male and female (p=0.547). Siddiqua et al[22] found that there was no significant difference seen in their study about the prevalence of HGV between the male (3.2%) and female (3.1%).

Conclusion :

Seropositivity did not differed among the blood donors, pregnant women, new born babies and healthy subjects (p=0.797). Seropositivity did not differed between previous blood transfusion and no previous blood transfusion (p=0.882). In conclusion there is high prevalence of HGV seropositivity among selected groups in the present study. Extrapolating the result to wider population of the region is not statistically valid due to small sample size restricted to a single center. However further studies with larger sample size should be carried out from time to time to obtain a dependable conclusion.

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