Outcome of Screening Test Performed on Volunteer Blood Donors in Chittagong City

International Journal of Scientific & Engineering Research Volume 3, Issue 12, December-2012

Jashim MU[1], Sanjoy KD[2], Suhrawardy SM[3], Moynal H[4], Pranab C[5]

Abstract— Introduction: In Bangladesh every year about 270,000 units of blood need for transfusion. To meet such a big amount blood transfusion needs huge numbers of donors. According to WHO estimate, in Bangladesh every year found up to 16 million new infection with HBV, 5 million new infection with HCV and 160,000 new cases of HIV infection of effective screening of blood donors. This study aimed to determine the prevalence of infectious diseases among the Chittagong city, Bangladesh.

Methods: This was a cross sectional study among 1500 volunteer blood donors in the Chittagong city from January, 2011 to September, 2011. Each donor was screened for Hepatitis B Virus, Hepatitis C virus, HIV, Malaria & Syphilis with Latex agglutination, immunochromatographic (ICT) test strip supplied by reagent manufacturer.

Results: A total of 1500 volunteer blood donors with different age group and occupations volunteer participated in the study. 1320 were male and 180 were female with on professional blood donor. There are found total 33 positive cases in screening test of which HBsAg positive 21 cases (1.40%), anti-HIV positive 02 cases (0.13%), anti-HCV positive 02 cases (0.13%), RPR positive 07 cases (0.46%), Malaria positive 01 case (0.06%).

Conclusion: This study proof that many apparently healthy blood donors are not safe donor, so screening test before blood or component of blood transfusion should be mandatory even for volunteer blood donor.

Index Terms— Blood Donors, WHO, Bangladesh, Chittagong, Blood Transfusion, HIV, HBV, HCV, MP, RPR.

1. *Md. Jashim Uddin, Assistant Professor & HOD Department of Pathology, BGC Trust Medical College.*
2. *Sanjoy Kumar Dey, Assistant Professor Department of Neonatology, BSMMU, Shahbag, Dhaka.*
3. *S. M. Suhrawardy, Assistant Professor Department of Physiology, BGC Trust Medical College.*
4. *Moynal Hossain, Assistant Professor Department of Community Medicine, BGC Trust Medical College.*
5. *Pranab Chowdhury, Senior Lecturer Department of Pathology, BGC Trust Medical College.*

Outcome of Screening Test Performed on Volunteer Blood Donors in Chittagong City

International Journal of Scientific & Engineering Research Volume 3, Issue 12, December-2012

1. To find out percentages of volunteer blood donors infected with Hepatitis B Virus, Hepatitis C virus, HIV, Malaria & syphilis.

2. To find out relation of the volunteer blood donors infected with infectious diseases with occupation.

3. To explore percentages of Male & Female among the different screening test positive volunteer blood donors.

4. To identify percentage of different age group among the volunteer blood donors infected with infectious diseases.

INTRODUCTION

Blood transfusion history dates back about 200 years and is relatively recent considering the history of mankind. The credit of first successful human to human blood transfusion goes Dr. James Blundell, an obstetrician, who successfully transfused 8 oz (227 ml) of blood to a patient of post partum haemorrhage in 1818.[2]

The practice of Modern blood transfusion began in early twentieth century, about a hundred years back, with the discovery of the ABO blood group antibodies and antigens by Nobel Prize winner Karl Landsteiner, an Austrian physician in 1901 and Rh blood group antigens by Landsteiner and wiener in 1940. [2]

According to WHO estimate the lack of effective screening of blood donor's results in up to 16 million new infections with HBV, 5 million new infections with HCV and 160,000 new cases of HIV infection every year. Incidences of transfusion mediated falciparum infected found in Bangladesh. [2]

For many years WHO has been working to help nation to make the transfusion safe with following guidelines[2]:

a. Establishment of a nationally coordinated blood transfusion service.

b. Collection of blood only from voluntary donors.

c. Testing of all blood for compatibility and TTIs and reduction of unnecessary transfusion.

In Bangladesh every year about 270,000 units of blood need for transfusion. To meet such a big amount blood transfusion needs huge numbers of donors. Unfortunately it has been found that in this country professional blood donors are providing majority of the units of blood annually. A total of 1,687,390 donations under safe blood transfusion program mainly from voluntary donors were screened throughout the country during a period of 8 years (2001-2008). One hundred eleven donors (0.0065%) were found to be Positive for HIV. Overall HBsAg, anti-HCV and RPR was found positive in 0.96%, 0.15% and 0.15% donation respectively.[2]

So considering all above discussion it is found very important to screen all blood donations both voluntary and professional to prevent transfusion Mediated infectious diseases.

METHODS & MATERIALS

Method: -

- Types of study- Descriptive cross sectional study.
- Place of study- Chittagong City.
- Period of study- January, 2011 to September, 2011.
- Sample size/number of cases- 1500.

Research Materials: -

- Blood sample collected in pre-labeled pilot tubes, serum separated from clotted blood.
- Sterile disposable plastic syringe.
- Latex agglutination immunochromatographic (ICT) test strip to detect-
  - HBsAg
  - Anti- HCV
  - Anti- HIV
  - Anti treponema
  - Malaria
- Leishman stained, Geimsa stained thin & thick blood film study for Malaria parasite.
- Procedure of test- Tests performed according instruction supplied by reagent manufacturer.

RESULTS

Results are shown in the following diagrams and tables.

Figure 1: **Distribution of volunteer blood donors by sex**

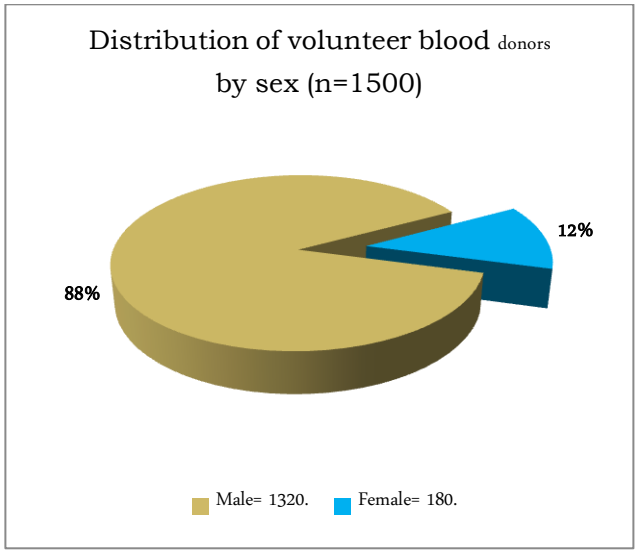

Figure 2: **Distribution of volunteer blood donors by age**

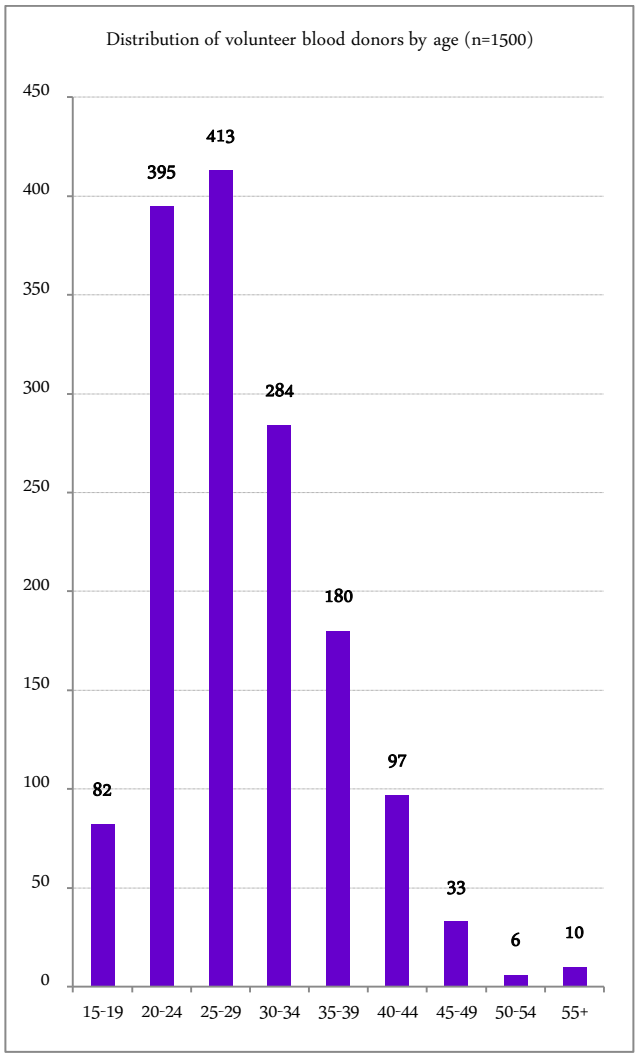

Figure 3: **Distribution of blood donor according to occupation**

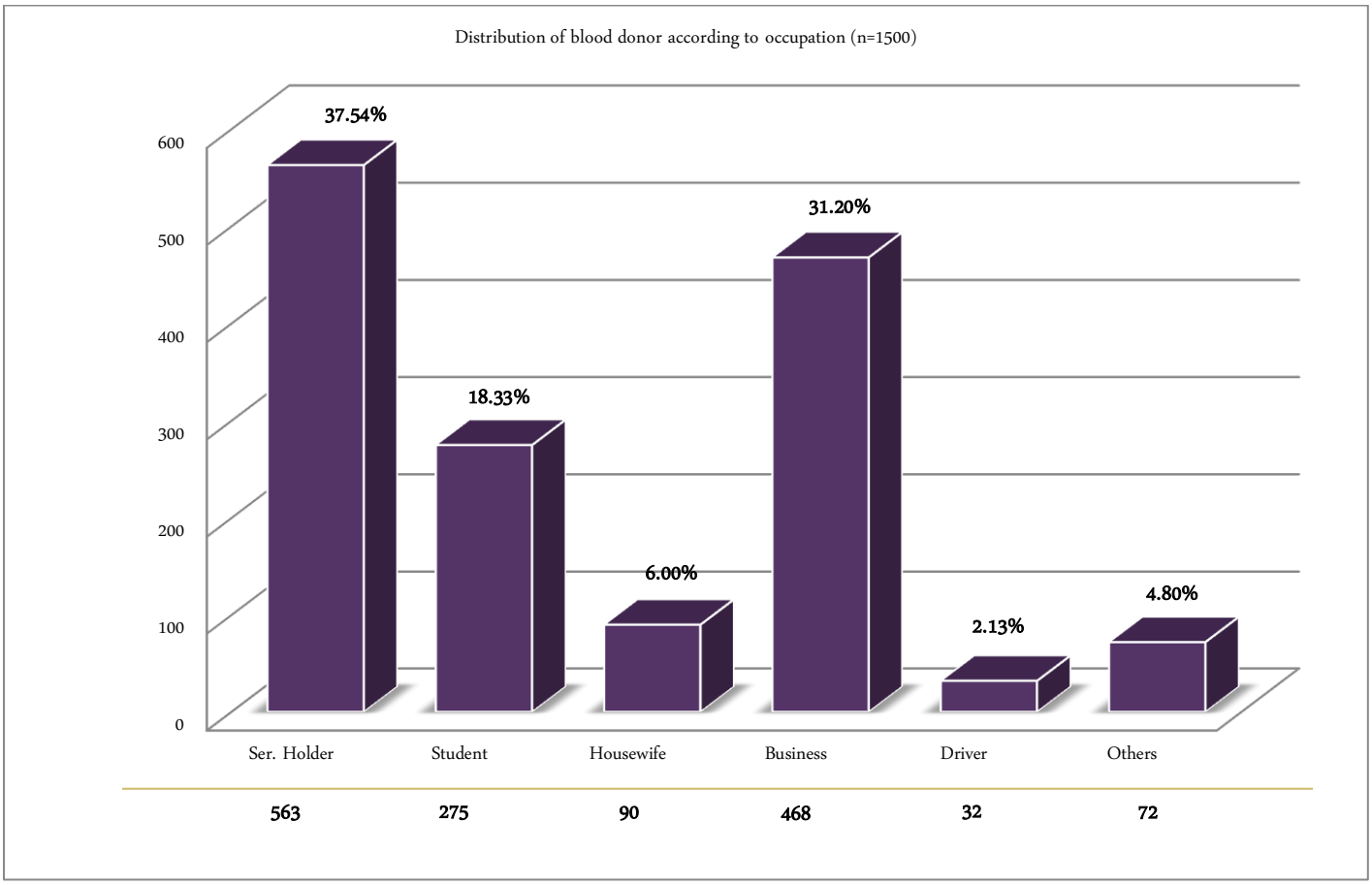

Figure 4: **Percentage of disease among the total positive cases**

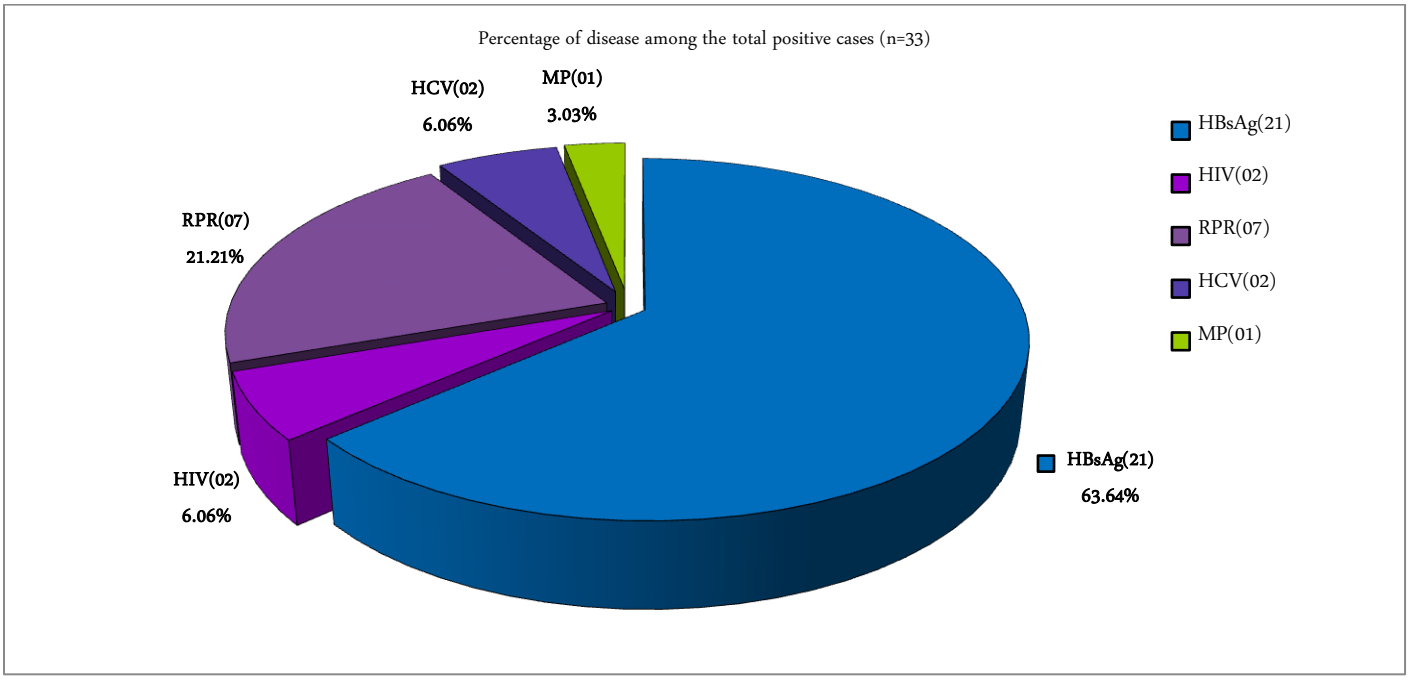

Table 1: **Distribution of volunteer blood donors by HBsAg Status**

Status of HBsAg	Number	Percentage
Positive	21	1.40 %
Negative	1479	98.60 %
Total	**1500**	**100 %**

Table 2: **Distribution of volunteer blood donors by HIV Status**

Status of HIV	Number	Percentage
Positive	02	0.13 %
Negative	1498	99.87 %
Total	**1500**	**100 %**

Table 3: **Distribution of volunteer blood donors by HCV Status**

Status of HCV	Number	Percentage
Positive	02	0.13 %
Negative	1498	99.87 %
Total	**1500**	**100 %**

Table 4: **Distribution of volunteer blood donors by RPR Status**

Status of RPR	Number	Percentage
Positive	07	0.46 %
Negative	1493	99.54 %
Total	**1500**	**100 %**

Table 5: **Distribution of volunteer blood donors by MP Status**

Status of MP	Number	Percentage
Positive	01	0.06 %
Negative	1499	99.94 %
Total	**1500**	**100 %**

Table 6: **Disease by Occupation (%)**

Occupation	HBsAg	HIV	HCV	RPR	MP	
Service Holder	7 $^{50}/_{33.33}$	1 $^{7.14}/_{50}$	1 $^{7.14}/_{50}$	4 $^{28.58}/_{57.14}$	1 $^{7.14}/_{100}$	**14 (100%)**
Student	4 $^{100}/_{19.05}$	0	0	0	0	**4 (100%)**
Housewife	0	0	0	0	0	**0 (100%)**
Business	8 $^{72.73}/_{38.10}$	0	1 $^{9.09}/_{50}$	2 $^{18.18}/_{28.57}$	0	**11 (100%)**
Driver	2 $^{66.66}/_{9.52}$	0	0	1 $^{33.34}/_{14.29}$	0	**3 (100%)**
Others	0	1 $^{100}/_{50}$	0	0	0	**1 (100%)**
Total	**21 (100%)**	**2 (100%)**	**2 (100%)**	**7 (100%)**	**1 (100%)**	

Table 7: **Disease by Age (%)**

Age in year	HBsAg	HIV	HCV	RPR	MP	
15 - 19	1 $^{100}/_{4.77}$	0	0	0	0	**1 (100%)**
20 - 24	6 $^{85.71}/_{28.56}$	0	0	1 $^{14.29}/_{14.29}$	0	**7 (100%)**
25 - 29	9 $^{81.82}/_{42.85}$	0	1 $^{9.09}/_{50}$	0	1 $^{9.09}/_{100}$	**11 (100%)**
30 - 34	4 $^{40}/_{19.05}$	2 $^{20}/_{100}$	0	4 $^{40}/_{57.14}$	0	**10 (100%)**
35 - 39	1 $^{50}/_{4.77}$	0	1 $^{50}/_{50}$	0	0	**2 (100%)**
40 - 44	0	0	0	2 $^{100}/_{28.57}$	0	**2 (100%)**
45 - 49	0	0	0	0	0	**0 (100%)**
50 - 54	0	0	0	0	0	**0 (100%)**
55+	0	0	0	0	0	**0 (100%)**
Total	**21 (100%)**	**2 (100%)**	**2 (100%)**	**7 (100%)**	**1 (100%)**	

Table 8: **Disease by Sex (%)**

Sex	HBsAg	HIV	HCV	RPR	MP	
Male	20 $^{62.5}/_{95.25}$	2 $^{6.25}/_{100}$	2 $^{6.25}/_{100}$	7 $^{21.87}/_{100}$	1 $^{3.13}/_{100}$	**32 (100%)**
Female	01 $^{100}/_{4.75}$	0	0	0	0	**1 (100%)**
Total	**21 (100%)**	**2 (100%)**	**2 (100%)**	**7 (100%)**	**1 (100%)**	

Table 9: **Disease by Blood Group (%)**

Blood Group	HBsAg	HIV	HCV	RPR	MP	
A+	6 $^{75}/_{28.57}$	0	0	1 $^{12.5}/_{14.29}$	1 $^{12.5}/_{100}$	**8 (100%)**
B+	7 $^{53.85}/_{33.33}$	1 $^{7.69}/_{50}$	1 $^{7.69}/_{50}$	4 $^{30.77}/_{57.14}$	0	**13 (100%)**
AB+	4 $^{80}/_{19.05}$	0	1 $^{20}/_{50}$	0	0	**5 (100%)**
O+	4 $^{57.14}/_{19.05}$	1 $^{14.29}/_{50}$	0	2 $^{28.57}/_{28.57}$	0	**7 (100%)**
A-	0	0	0	0	0	**0 (100%)**
B-	0	0	0	0	0	**0 (100%)**
AB-	0	0	0	0	0	**0 (100%)**
O-	0	0	0	0	0	**0 (100%)**
Total	**21 (100%)**	**2 (100%)**	**2 (100%)**	**7 (100%)**	**1 (100%)**	

DISCUSSION

In this study, total numbers of donors are 1500 among which there was no professional donor. Among them HBsAg positive was 21 cases (1.40%), anti-HIV positive 02cases (0.13%), anti-HCV positive 02 cases (0.13%), RPR (TP) positive 07 cases (0.46%), Malaria positive 01 case (0.06%).

In a **"Study on screening tests among the blood donors in Dhaka Medical College Hospital, Bangladesh"** [1] done from January to December 2009 where out of 21,448 donors HBsAg positive were 297 (1.38%), anti-HCV positive 38 (0.10%), RPR (TP) positive 09 (0.40%), MP positive 23 (0.11%), [1] which are almost near to this study.

In a another study **"Incidence of common transfusion transmitted diseases among blood donors"** [7] done in Khulna Medical College Hospital (KMCH) on 12,270 voluntary and directed donors during the period from 1st July 2007 to 30th June 2008 to see the incidence of HBV, HIV, HCV, Syphilis & MP, where it shows HBsAg positive were 171 (1.39%), anti-HIV positive 01 (0.008%), anti-HCV positive 03 (0.024%), none found positive for RPR (TP) and Malaria. [7]

In our study found HBsAg positive were 21 cases (1.40%), anti-HIV positive 02 cases (0.13%), anti-HCV positive 02 cases (0.13%), RPR (TP) positive 07 cases (0.46%), Malaria positive 01 case (0.06%). Compare to this study Khulna Medical College Hospital (KMCH) study shows less numbers of HIV positive, no positive cases of RPR (TP) and Malaria. Probably because of geographical different, professional different as of Chittagong are more overseas worker & Chittagong is a Malaria zone too, period of study and prevalence of unsafe sex & I.V. drug abusers should consider because all those are increasing now a days.

One study in Nigeria **"Sexual transmission of the hepatitis B virus among blood donors in a tertiary hospital in Nigeria"** [9] done are 234 blood donors aged 18 to 56 years (mean 27.3 years) shows 40 (17.1%) participants found positive and 194 (82.9%) negative for HBsAg. [9]

In our study it is found only 21 (1.40%) cases positive for HBsAg among 1500 cases. This big different of HBsAg positive probably because of religious conservations, more safe sex and less I.V. drug abusers in Bangladesh.

One study in Philippines **"The prevalence of HBsAg(+) and anti-HCV(+) among healthy blood donors at EAMC, Quezon City"** [6] done in 6,560 healthy blood donors from December 1, 2003 to November 30, 2004 at East Avenue Medical Center among which 503 (7.67%) donors are HBsAg positive. There were only 07 (0.12%) donors who tested positive for anti-HCV among 6,057 cases of the donors.[6] & another in Turkey **"The prevalence of HBV, HCV and HIV infection among donor in Ijmer, Turkey"** [5] HBV positive (1.38%) and HCV positive (0.35%).[5]

In our study HBsAg positive was 21 cases (1.40%) & anti-HCV positive 02 cases (0.13%).**I**n a study in Canada **"Incidence of HBV, HCV and HIV in Canada"** [4] which were HBsAg positive is (12.40%), HIV positive (0.38%) and HCV positive (16.83%). [4]

In our study, HBsAg positive was 21 cases (1.40%), anti-HIV positive 02 cases (0.13%) & anti-HCV positive 02 cases (0.13%).

In Bombay, HBsAg positive in 06% and in Pakistan it is 05%. [3]

In our study, HBsAg positive was 1.40%.

In another study done by **"Safe blood transfusion center, Annual reports of donor screening, DMCH, Dhaka"**[8] in 2009 which were HBsAg positive (0.96%), HIV positive (0.0065%), HCV positive (0.15%) & RPR (TP) positive (0.15%). [8]

In our study HBsAg positive was (1.40%), anti-HIV positive (0.13%), anti-HCV (0.13%), RPR (TP) positive (0.46%).

CONCLUSION

In this study it has been found that out of 1500 volunteer blood donors 33 persons are screening positive who are apparently healthy but they don't has any knowledge that they are infected by these sort of transmissible infective dangerous disease which can cause

1. Serious complication to the affected individuals as they would not seek medical care as long as they remain asymptomatic.
2. Easy transmission to other healthy people because of lacking of preventive measure because the affected individuals and his surrounding peoples, family members are not aware about the condition.

This study proof that many apparently healthy blood donors are not safe donor, so screening test before blood or component of blood transfusion should be mandatory even for volunteer blood donor.

SUGGESTION

Increasing level of consciousness about transmission of transmissible disease by counseling about blood & blood component transfusion, multiple uses of needles, safe sex etc.

Assuring use of sterile surgical instruments, syringe, using gloves by medical staff.

Government, NGO should come forward make the screening test available & chipper.

ACKNOWLEDGEMENT

Special thanks to **"Sheik Md. Morshedul Alam Chy"** Technologist (Agrani Pathology Laboratory, Banadrtila, Chittagong-4218, Bangladesh) for his cordial help for the study.

REFERENCES

1. *Chowdhury FS, Begum HA, Adnan SD, Hoque MM, Hossain MZ, Siddiqui MAE, et al. Study on screening tests among the blood donors in DMCH, Bangladesh. J Dhaka Medcoll. 2010; 19(1): 16-18.*
2. *Mahmud Z, et al. Are the blood transfusions safe! JAFMC Bangladesh. Vol 5, No 1 (June) 2009.*
3. *Rahman K, Khan AA, Huda Z, et al. Prevalence of seromarkers of HBV and HCV in health care personal and apparently healthy blood donors. J Pak Med Assoc. 46: 152-4.*
4. *Chiavetta JA, Escobar M, et al. Incidence of HBV, HCV and HIV in Canada, CMAJ. 2003; 169(8).*
5. *The prevalence of HBV, HCV and HIV infection among donor in Ijmer, Turkey. Indian J Med Microbiol. 26(3).*
6. *John G Rodenas, Laura C Bacasen, Ernesto R Que, et al. The prevalence of HBsAg(+) and anti-HCV(+) among healthy blood donors at EAMC, Quezon City. Phil J of Gastroenterology 2006; 2:64:70.*
7. *Ahmed MU, Begum HA, Hossain T, Chakraborty P, et al. Incidence of common transfusion transmitted diseases among blood donors. JAFMC Bangladesh. Vol 5, No 1 (June) 2009.*
8. *Safe blood transfusion center. Annual reports of donor screening, DMCH, Dhaka. 2009.*
9. *Adekanle O, Ndububa DA, Ayodeji OO, Paul-Odo B, Folorunso TA, et al. Sexual transmission of the hepatitis B virus among blood donors in a tertiary hospital in Nigeria. Singapore Med J 2010; 51(12): 944.*