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ANALYSIS OF BLOOD DONORS AT A MAJOR TERTIARY-CARE HOSPITAL OF KARACHI AND SEROPREVALENCE OF BLOOD-BORNE HEPATITIS AND HIV.

1. **ZULFIQAR ALI SHAIKH**
MBBS, MSc. (Public Health)
2. **GHULAM ALI**
MBBS, MD;
3. **PERWAIZ AHMED MAKHDOOM**
MBBS, DMJ;

1- ***Assistant Professor,*** **Community Medicine,** DOW INTERNATIONAL MEDICAL COLLEGE, DOW UNIVERSITY OF HEALTH SCIENCES, (DUHS), KARACHI.
2- ***Associate Professor,*** **Forensic Medicine,** SINDH MEDICAL COLLEGE, DUHS, KARACHI.
3- ***Assistant Professor,*** **Forensic Medicine,** SINDH MEDICAL COLLEGE, DUHS, KARACHI. PAKISTAN.

Correspondence:
DR ZULFIQAR ALI SHAIKH
Head Community Medicine Department,
DOW INTERNATIONAL MEDICAL COLLEGE, DUHS, KARACHI.
Email: drzulfiqarshaikh@gmail.com
Contact # 0333-2356234

ABSTRACT

Blood-borne viral hepatitis such as hepatitis B and C have been on a tremendous rise specifically in the Asian, Mediterranean and Sub-Sahara African region. The trend has not been any different in Pakistan in terms of disease prevalence, to say the least. But how does the seroprevalence of these diseases in healthy blood donors of Pakistan compare to the rest of the countries of the affected region? To answer this query, we carried out a cross-sectional prevalence study on 2000 healthy blood donors at Jinnah Post-graduate & Medical Center over a period of three months. The major chunk was male, replacement donors from urban setting having blood groups of B+ (31%), O+ (29%), and A+ (24%). Among these donors, 3.9% of were found to be positive for HBsAg and 5.9% for HCV antibodies; while none tested positive for HIV ELISA. The results of the present study clearly proclaims that despite Herculean efforts to prevent spread of these chronic, debilitating illnesses, Pakistan still seems to have a significantly higher seroprevalence of both hepatitis B and C. Inability to effectively cut down on the transmission of these hematogenous liver diseases is most likely attributed to persistence of certain false healthcare and social practices indigenous to our society.

KEYWORDS: Hepatitis B, Hepatitis C, Seroprevalence.

INTRODUCTION

Although all chronic blood-borne infections are exponentially increasing in the developing nations, hepatitis B and C seem to have outpaced all the rest.[1] Hepatitis C is the most widespread liver disease in the world with hepatitis B following hot on its heels.[2] The major contribution is thought to be played by several identified risk factors, particularly in the developing countries. These predominantly include several types of horizontal transmission such as injudicious use of injectables, intra-venous drug abuse, promiscuity in sexual relationships, unsafe dental treatments, and substandard barber practices.

In Pakistan, majority of studies on hepatitis C prevalence have been carried out on high risk groups such as thalassemics and patients with hepatocellular carcinoma; and similar is the case with hepatitis B. A better estimation of the actual prevalence of these illnesses can be obtained by surveying healthy adults who are screened for these infections randomly. The purpose of this study was to assess the prevalence of blood-borne hepatitis among healthy blood donors at a major tertiary care facility of Karachi, analyze and compare it with the pre-existing data and critically infer upon factors for its persistently increased rate despite tangible preventive measures.

MATERIALS AND METHODS

This is a cross-sectional descriptive study conducted at the Blood Bank of Jinnah Post-graduate & Medical Center (JPMC) between June and August, 2008. All blood donors during this time period were included in the study with notification of their demographics, blood pressures, pulse, ethnicity, gender, age, blood group, addictions and whether they were volunteers or replacement donors.

The detection tests used were Hepatitis C antibody (anti-HCV), Hepatitis B surface Antigen (HBsAg) and ELISA for HIV antibody. Results were compiled by using SPSS (version 12.0) and MS Word. Means and standard deviations were calculated for quantitative variables and proportions for categorical variables. 95% confidence interval was calculated for each association. P-Value of < 0.5 was considered statistically significant.

RESULTS

A total of 2000 blood donors were included in the study that presented at JPMC Blood Bank during the summer of 2008. The age range was in between 16-58 years with the major proportion of blood donors lying in between 20-29. Almost all of them (1990/2000) were males. The weight ranged between 120-214 lbs. with the mean weight as 143 lbs. Nearly 95% (1918) had their hemoglobin in the range of 12-12.9. Demographic distribution was inclined mainly towards the urban areas with only 5% of the blood donors belonging to suburban and rural parts of the city. Only to analyze the frequency of blood donations, we also included the number of previous donations by each donor. It turned out that nearly half (48.8%) were donating blood for the first time, 37.6% for the second time and 6.3% and 7.3% for third and fourth time, respectively.

In blood group categorization, B+ was found to be the commonest accounting for 620 (31%) of blood donors; O+ (28.9%) and A+ (23.7%) were second and third, respectively. Frequency of AB+ in studied blood donors was 9.2% and frequencies of less commonly occurring blood groups were as follows: O- (2.2%), A- (2%), B- (1.8%), and AB- (1.2%).

In terms of blood-borne viral diseases' seropositivity, 78 (3.9%) were found to have a reactive HBsAg and 118 (5.9%) for Anti-HCV. However, none of the cases showed a positive ELISA test for HIV antibody, as shown in figure 1.

TABLE 1:
DEMOGRAPHIC FEATURES AND SEROPOSITIVITY OF THE STUDY SUBJECTS

Gender	**Male**	**Female**	**Total**	
	1990	10	2000	
Age	Range	> 80%		
	16-58 Years	20-29 Years		
Area	Urban	Suburban / Rural		
	1900 (95%)	100 (5%)		
Frequency of blood donations	First Time 976 (48.8%)	Second 752 (37.6%)	Third 126 (6.3%)	More than three 146 (7.3%)
Blood Group (+ve)	B+ 620 (31%)	O+ 578 (28.9%)	A+ 474 (23.7%)	AB+ 184 (9.2%)
Blood Group (-ve)	O- 44 (2.2%),	A- 40 (2%)	B- 36 (1.8%)	AB- 24 (1.2%)

DISCUSSION

Hepatitis B and C together affect nearly half a million people worldwide and the prevalence is still on the rise, at least in the developing countries.[3] While these diseases reportedly affect a varying proportion of Pakistani population, every subsequent study indicates an increase in the prevalence than the prior ones. It has been estimated that in Pakistan there are around 9 million carriers of HBV and 14 million carriers of HCV.[4] A true estimate of the actual prevalence can be elucidated via knowledge of seroprevalence of HBsAg and Anti-HCV and any increasing trend that might have taken place lately, in order to bring about affective preventive measures against this monstrous epidemic in our society.

The severe liver diseases, including cirrhosis related end-stage liver disease and hepatocellular carcinoma are caused by Hepatitis B and C.[1] Given its large population (170 million) and high rates of infection Pakistan is among the worst affected nations. In Pakistan, there is lack of information about the prevalence of this emerging epidemic; it is of paramount importance to analyze seroprevalence of these illnesses, compare them with other parts of the country and whole of the world and, thereafter, institute effective preventive measures. In our study, the prevalence of HCV antibodies turned out to be 5.9% in healthy adults and HBsAg was 3.9% in them. In different studies, conducted in various parts of Pakistan, the prevalence has been estimated in the range of 3-10% for HBV and 2.2-14% for HCV.[5] Although both the type of viruses are infecting population throughout the country, the prevalence is found more in Punjab and Sindh as compared with NWFP, Balochistan, and Azad Kashmir.[6] The reason for this highly variable seroprevalence for HBV and HCV, as shown in different studies, among similar populations, even within the same province, could be due to the fact that blood-born infections like hepatitis and HIV are transmitted sporadically or in low level epidemics. Unlike highly contagious diseases like measles which have much more predictable seroprevalence patterns.[7]

Earlier studies carried out in Pakistan used various different methods of selection of the study population. In professional blood donors, 6.2% prevalence of anti-HCV and 16.3% in admitted patients have been reported.[8] Among young soldiers, it is estimated that there is a prevalence of 3% and 3.3% for HBsAg and HCV antibodies respectively.[9] The carrier rate of 3% of HBsAg among the population of Karachi has also been reported.[10] In the present study, the seroprevalence of both HCV (5.9%) and HBV (3.9%) manifest a rather increased estimate as compared to the former studies, since this study represents a large sample size of healthy blood donors. A comprehensive meta-analysis carried out by Ali et al. in early 2009, which incorporated a fairly large number of studies done on both pediatric and adult subjects, revealed, based on combined data from blood donors and non-donors, that the overall seroprevalence in healthy adults for HBsAg was 2.4% (range 1.4-11%), and for HCV was 3% (range 0.5-31.9%).[11] Statistical reports from Punjab suggested a higher prevalence of HCV[12] and Balochistan with a higher seroprevalence of HBsAg[13], although wide variations within these provinces were noted but no clear reasons were identified.

While there has been an alarming increase both in the carrier state and disease prevalence of Hepatitis B and C, there has also been a concomitant upsurge of mass awareness campaigns. However, as depicted by the present study, the seroprevalence increase rate still defeats the primary preventive measures. Most probable risk factors, specifically in our country, include a persistent trend of preferring injectables over oral medications. A major route of transmission of HBV and HCV in developing countries is the unnecessary use of injections in healthcare settings.[14] Although a few studies in Pakistan have demonstrated an improvement in the practice of non-sterile and irrational injections by simple community based interventions[15], the seroprevalence still remains on a rise. Even though the data about practices of blood banks in Pakistan is limited, receipt of blood

and blood products is a well identified risk factor for transmission of HBV and HCV.[16] Furthermore, Injection Drug Users (IDUs) Injection Drug Users (IDUs) are numerous in Pakistan and continue to be the major source of infection of hepatitis B and C; and now HIV for the general population of the country.[17] Occupational risks also contribute significantly towards the overall disease burden in Pakistan. A few professions like healthcare professionals, commercial sex workers and barbers are at an increased risk of getting HBV and HCV.[18] In addition, shaving by barbers who use contaminated razors may also be a major source of the spread of HBV and HCV.[19] Lastly, household contacts/spousal transmission would largely be responsible for the transmission of HCV and not HBV. The sexual transmission of HCV has been found very low.[20]

CONCLUSION

While certain concrete measures, such as inclusion of immunization against HBV in EPI in 2002 and comprehensive blood screening have been taken towards effective primary prevention against HBV and HCV, the task still remains undone. Further studies need to be done to elucidate the probable causes of the recent inability to effectively reduce the prevalence and prevent this epidemic of hepatitis B and C to transform into a monstrous state of endemicity.

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