

Past and Future Perspectives for Hepatitis B and C in Pakistan

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ABSTRACT

INTRODUCTION

Hepatitis B and C are mainly viral infections of liver affecting 350 million and 185 million people worldwide and have caused 786000 and 399000 deaths respectively. Their causative agent is Hepatitis B virus (HBV) and hepatitis C virus (HCV). (1,2,3,4) The chronic stage of HBV and HCV can lead to cirrhosis of the liver and hepatocellular carcinoma. (5) HBV and HCV are blood-borne infections transmitted mainly through blood and its products. (6) Viral Hepatitis has emerged as a huge problem for health facilities since it has been ranked 5th as the commonest cause of death globally. (5) In developing countries like Pakistan HBV and HCV are endemic. Both of them are a major health concern. Their Prevalence among the general population is 4.33% for HBV and 4.9% for HCV. (7, 8, 9)

Pakistan is a country with a low budget (0.75% of GDP) for health and limited resources. HBV and HCV have put a great burden on it. (10) To cope with it, strict surveillance is required. With these resources, it is difficult to screen the whole population. Almost 1.5 million people donate blood annually in Pakistan. Being blood-borne infections, screening of healthy donors will not only prevent the disease spread but also will give an estimate of disease burden. (11,12,13)

However, it may underestimate or overestimate the disease but can help know the disease burden in general. (14) The literature on the prevalence of HBV and HCV in healthy blood donors suggested being a percentage of 1.4 – 2.99% and 3.1–4.99% respectively in a ten-year study of Shoukat Khanum. This has proved a decreasing trend in the prevalence of HBV and an increasing percentage for HCV. (15) In Northern and Southern Pakistan it was found to be 3.33% and 2.28% for HBV and 4.0% and 1.18% for HCV respectively with the same trend. (16,17) However, we could not find any study specifically of

Gujranwala. In our study, we screened Healthy donors visiting DHQ Teaching hospital Gujranwala to estimate disease burden and predicted its future prevalence to perceive an upcoming burden.

METHODOLOGY

Study Design

Retrospective cross-sectional study.

Centre

DHQ Teaching Hospital, Gujranwala.

Sample Size

66,308 healthy blood donors.

Study Duration

Six years (from January 2010 to December 2015).

Inclusion and Exclusion Criteria

Blood donors of age ranging from 19 to 60, non-drug abusers, not suffering from any chronic disease like diabetes, Chronic kidney disease, and tuberculosis were included in the study. All those ages below 19 and above 60, High-risk populations like drug abusers, sex workers, those on dialysis, Diabetics, and patients of TB were excluded. This was done with a proforma stating the patient's history.

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HBV Testing

To detect HBV, a qualitative test based on lateral flow immunoassay using diagnostic kits (DS) was used. The double-antibody sandwich technique using a combination of polyclonal and monoclonal antibodies was applied to detect raised levels of HBsAg for HBV.

HCV Testing

This was done with a diagnostic kit, IHC-302 - HCV Rapid Test Cassette by Vaxpert, Inc. Miami, Florida that uses principles of lateral flow immunoassay to qualitatively detect HCV. The membrane of the HCV kit was coated with both antigen and antibodies in the test zone and control zone respectively. The presence of HCV antibodies produced a dark line in both zones.

Prediction Method

Data were analyzed in SPSS 20 for simple frequencies. Based on data obtained for six years we predicted the prevalence of HBV and HCV in 2030. To predict for future (2030), Least Square method among Time Series analysis of regression was used. It was applied since a prediction was needed in time for the individual variable. This was found using the following formulas:

RESULTS

We screened 66,308 healthy donors in which 715 (1.08%) and 1846 (2.78%) were positive for HBV and HCV respectively. We predicted the percentage of HBV and HCV for 2030 to be 3.25% and 6.36% respectively. The contribution of each year with predicted values for 2030 is given below. (Table 1)

Table 1: Prevalance Of HBV and HCV in Healthy Blood Donors

Years	Total	+ ve Hep- B	+ ve Hep- C	B%	C%
2010	10970	79	270	0.072	2.96
2011	10813	96	235	.0887	2.17
2012	11473	118	299	1.028	2.606
2013	10513	117	288	1.11	2.74
2014	10691	131	359	1.22	3.35
2015	11898	174	395	1.466	3.33
Cumulati ve Value	66308	715	1846	1.08%	2.78%
For 2030	12584	409	801	3.25%	6.36%

Table 2: For HCV.

Years	Y	X	XY
2010	79	-5	-395

2011	96	-3	-288
2012	118	-1	-118
2013	117	1	117
2014	131	3	393
2015	174	5	870
	$\Sigma = 715$	0	$\Sigma = 579$

Figure1:Graph Showing HBV prevalence throughout these years.

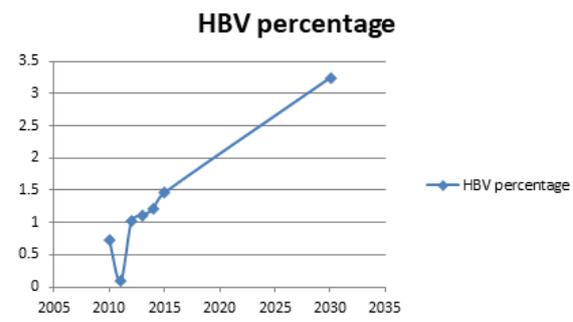
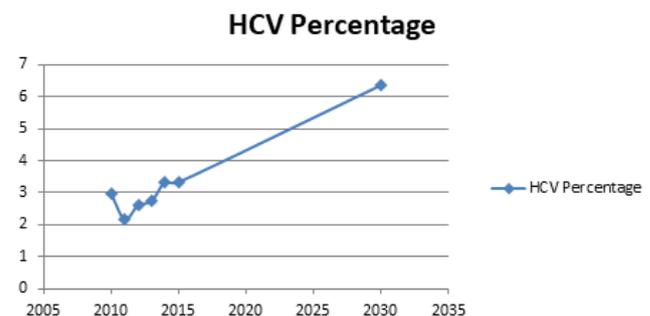


Figure2:Graph Showing HCV prevalence throughout these years.



DISCUSSION

HBV and HCV are viral infections of the liver, disrupting its architecture, causing its cirrhosis and hepatocellular carcinoma. They are endemic in Pakistan. Both of these are putting a great burden on the economy of the state. In order to reduce the burden, special policies are the need of the hour. Since they are blood-borne infections, screening for healthy donors is a good tool to assess disease burden. This will prevent transmission of the disease, in addition, to offer treatment to asymptomatic carriers diagnosed through screening. In our study, a six-year screening of blood donors provided a percentage of 1.08% for HBV and 2.78% for HCV. An increasing trend in their percentages was observed for HBV throughout these years. This has also been found in other studies for HCV but not for HBV.

We found an increasing percentage of HCV throughout these years except for a small dip 2011 the reason for which is not known to us. However, HCV percentage was relatively higher in our study but was comparable with other studies of Pakistan. HCV percentage should decrease since a very good treatment is available for it. (18,19) This is not decreasing probably due to a lack of knowledge of the disease.

The HBV prevalence was found increasing in our study. But HBV percentage has been decreasing in other studies of Pakistan. This is probably due to vaccination and the availability of a better treatment. (20,21) However, our study revealed a contrasting fact to the literature showing an increasing percentage of HBV in healthy donors but this was lower than HCV. This contrast might be due to poor sterilization of surgical instruments being used, the use of unsterile syringes, lesser awareness of the disease transmission, decreased the availability of resources for treatment and non-compliance of people to treatment and vaccination. This is an alarming situation that needs to be addressed properly and seriously by health facilities.

We predicted the percentage of HBV and HCV for 2030 which was 3.25% and 6.36% respectively. These are seriously higher percentages, casting a lethal shadow of the future. The need of the hour is to come up with better policies obeying the limitations of resources. Prevention is the first target that can be achieved by educating the masses and health care workers. This is possible with seminars, pamphlets, and special training courses. Proper sterilization and efficient screening are other tools to reduce the spread of disease. A well organized and well-developed plan of vaccination will provide strength to the target. The government should provide treatment either free of cost or at a lower price to make treatment feasible for the whole community.

The limitation of our study is that it has not depicted the true load of the disease in the community. This is due to the fact that most of the donors were males and were younger. This has excluded old age patients, children, and females which constitute a major portion of the population. Demographic statistics of donors were lacking in our study. However, Our study is a good tool to visualize the disaster of HBV and HCV in the future. In a nutshell, HCV and HBV must be addressed both at the government and community level to eradicate them.

CONCLUSION

The study showed a higher burden of HBV and HCV in the recent past and predicted a much lethal percentage for the future. This drastically higher percentage would not only kill and deteriorate the quality of thousands of human beings but also will put a great burden on the economy of the Country. This necessitates both preventive and therapeutic measurements to be taken to save precious human lives.

REFERENCES

- Perz JF, Armstrong GL, Farrington LA, Hutin YJ, Bell BP. The contributions of hepatitis B virus and hepatitis C virus infections to cirrhosis and primary liver cancer worldwide. *J Hepatol.* 2006;45:529-38.
- Dienstag JL. Hepatitis B virus infection. *N Engl J Med.* 2008 Oct 2;359(14):1486-500.
- Petruzzello A, Marigliano S, Loquercio G, Cozzolino A, Cacciapuoti C. Global epidemiology of hepatitis C virus infection: An update of the distribution and circulation of hepatitis C virus genotypes. *World J Gastroenterol.* 2016;22(34):7824-40.
- Daniel C. Worldwide Hepatitis Statistics. Incidence and prevalence of the five types of hepatitis [Internet]. New York City, U.S.: Very well Health. February 16, 2018.
- Shaw-Stiffel TA. Chronic hepatitis. In: Mandell GL, Bennett JE, Philadelphia DR, Livingstone C, editors. (eds.). *Principles and Practice of Infectious Diseases.* New York, NY: Churchill, 2000;1297-331.
- Francisci D, Antonelli S, Preziosi R, Mecozzi F, Stagni G, Pauluzzi S: Risk factors for acute parentally transmitted viral hepatitis: a 20-year study. *Eur J Epidemiol.* 1993;9:625-8.
- Zuberi SJ, Lodhi TZ, Alam SE. Spectrum of viral hepatitis. *JPMA* 1991;41:288.
- Ali M, Idrees M, Ali L, Hussain A, Ur Rehman I, Saleem S, et al. Hepatitis B virus in Pakistan: A systemic review of prevalence, risk factors, awareness, status and genotypes. *Virology.* 2011 Mar 6;8:102.
- Waheed Y, Shafi T, Safi SZ, Qadri I. Hepatitis C virus in Pakistan: a systemic review of prevalence, genotypes and risk factors. *World J Gastroenterol.* 2009;15(45):5647-53
- Akram M, Khan FJ. Health care services and government spending in Pakistan. *Pakistan institute of development economics, Islamabad. Policy Working Papers, 3.* (2007).
- Niqur JM. Blood safety in Pakistan. January–February 1995. WHO/EMRO document WHO-EM/GPA/91/E/R/05.95/27. Alexandria: World Health Organization Regional Office for the Eastern Mediterranean; 1995.
- Jafri W, Jafri N, Yakoob J, Islam M, Tirmizi SF, Jafar T, et al. Hepatitis B and C: prevalence and risk factors associated with seropositivity among children in Karachi, Pakistan. *BMC Inf Dis.* 2006;6(1):1.
- Ali SA, Donahue RM, Qureshi H, Vermund SH. Hepatitis B and hepatitis C in Pakistan: prevalence and risk factors. *Int J Infect Dis.* 2009;13(1):9-19.
- Afzal MS. Does HCV Prevalence in Blood Donors Reflects the Incidence in General Population? A Study for Global Impact. *J Antivir Antiretrovir.* 2017;9(3):065-068.
- Sultan F, Mehmood T, Mahmood MT. Infectious pathogens in volunteer and replacement blood donors in Pakistan: a ten-year experience. *Int. J. Infect. Dis.* 2007;11(5):407-12.
- Kekepo GN, Bhally HS, Khaliq G, Kayani N, Burney IA, Siddiqui T, et al. Epidemiology of blood-borne viruses: a study of healthy blood donors in Southern Pakistan. *Southeast Asian J Trop Med Public Health.* 1996 Dec;27(4):703-6.
- Khattak MF, Salamat N, Bhatti FA, Qureshi TZ. Seroprevalence of Hepatitis B, C and HIV in Blood Donors in Northern Pakistan. *J Pak Med Assoc.* 2002 Sep;52(9):398-402
- Jesudian AB, Gambarin-Gelwan M, Jacobson IM. Advances in the treatment of hepatitis C virus infection. *Gastroenterol Hepatol (N Y).* 2012;8(2):91-101.
- Stedman CA. Current prospects for interferon-free treatment of hepatitis C in 2012. *J Gastroenterol Hepatol.* 2013 Jan;28(1):38-45
- World Health Organization (WHO). Integrating hepatitis B vaccine into EPI programs. (WHO Special Report). *Pak Paed J,* 19; 17:85-7.
- Zoutendijk R, Reijnders JG, Zoulim F, Brown A, Mutimer DJ, Hofmann WP, et al. Virological response to entecavir is associated with a better clinical outcome in chronic hepatitis B patients with cirrhosis. *Gut.* 2013;62:760-5.