

Prevalence of Hepatitis B and Hepatitis C in Pakistan- An Updated Characterization

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Abstract

Background: Hepatitis B and C are the high burden diseases, infecting 62-79 million people worldwide. Pakistan is reporting alarmingly high numbers of seroprevalence and active infection of HBV and HCV in population. Several risk factors involve IV drug abuse, surgical and dental procedures, sexual contact, less awareness about vaccination, shaving kits, , placental transmission, improperly sterilized medical equipment and unscreened blood transfusions. Our present study is an attempt to assess prevalence of HBV and HCV in Pakistan during 2016-2023.

Methods: Literature survey about the populations being affected by HBV and HCV was done by using the search tool Google Scholar during the abovementioned timeline. Articles were screened for the relevant data. Descriptive and qualitative analysis was done by the available data.

Results: Prevalence of HBV and HCV was highest in Sindh (7%), followed by KPK (6.6%) and then Punjab (5.6%) and Baluchistan and F.A.T.A being less infected. High risk and low risk populations were identified statistically, and genotypic distribution was also characterized.

Conclusion: Alarming rise in HBV and HCV signals the dire need of better treatment and preventive initiatives to be taken by Government and individuals.

Keywords: Hepatitis B; hepatitis C; liver infections; blood-borne infection

Introduction

Hepatitis is an inflammatory disease of the liver. Hepatitis B virus (HBV) is a double stranded DNA virus that affects about 4.55 million people of Pakistan. Whereas Hepatitis C virus (HCV) is a single stranded RNA virus that inflicts 8.74 million Pakistani individuals [1]. Both viral diseases are pathologically alarming as

later stages lead to hepatocellular carcinoma and liver cirrhosis. Both viral infections are found to cause 1.34 million deaths globally [2]. Children are more prone to acquire this infection and about 90% of newborns have hepatitis [3]. Socio-economic status and genotypic distribution vary with geographical settings and so the prevalence of HBV and HCV infections.

Methods

Selected available data of epidemiology of HBV and HCV in Pakistan was reviewed on Google scholar from 2016-2023. The work is presented to aware the population of Pakistan about the prevalence of HBV and HCV (the two high burden liver infections) to promote better hygiene and vaccination practices to undo the detrimental impacts.

Data acquisition

Key words "Prevalence of Hepatitis B and C in Pakistan" were searched on Google scholar and timeline was adjusted to systematically review relevant studies done during 2016-2023.

Screening of Data

All the obtained articles were screened thoroughly to obtain the data regarding the high risk and low risk populations and prevalence of HBV and HCV in different areas of Pakistan.

Data analysis and organization

All the statistical data was analyzed, including maps and graphs. Few studies reported the studies on HAV and HDV and co-morbidities and were excluded to only focus on the epidemiology of HBV and HCV. All the findings of included articles were analyzed and organized, based on the categories:

- High risk and low risk populations:
- Geographical prevalence of HBV and HCV
- Genotypic distribution of types and sub-types of HBV and HCV.

Reporting the findings

Findings were keenly described and reported in the form of tables, graphs and diagrams.

Our methodology is shown in the flowchart given in Figure 1.

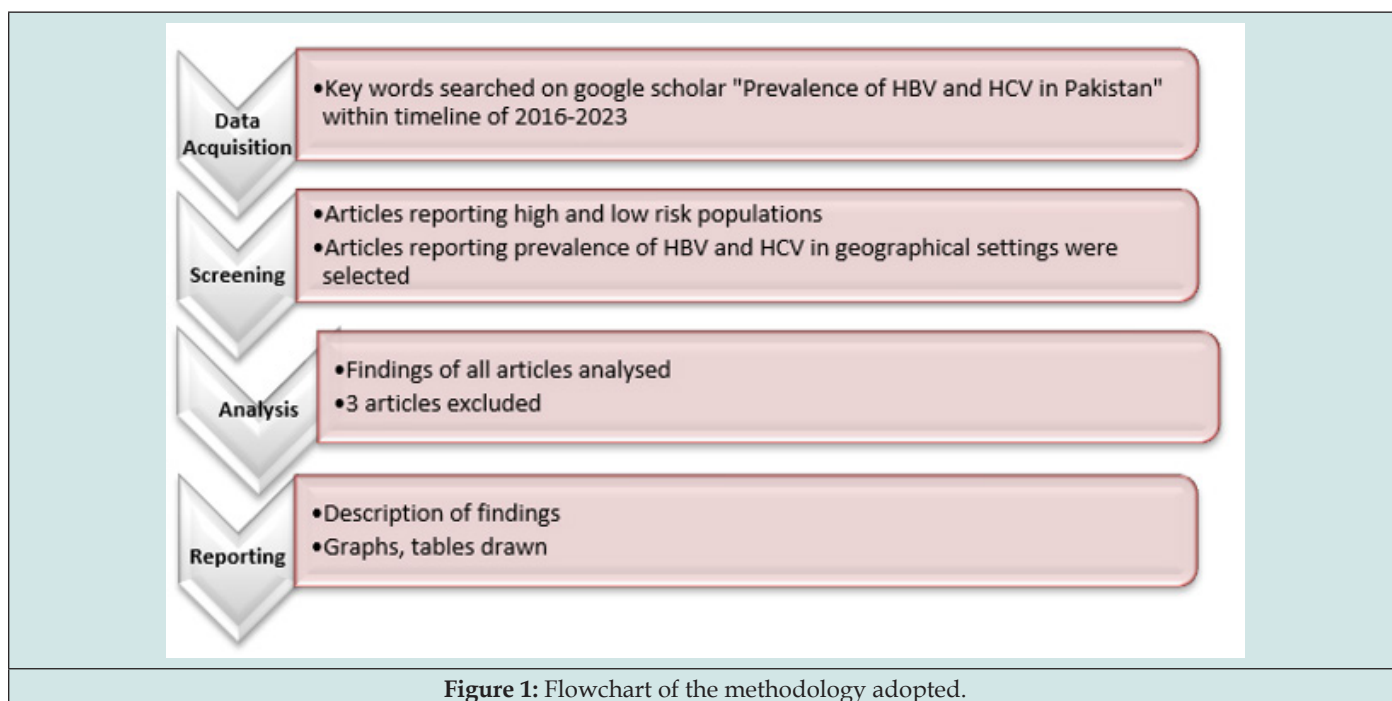


Figure 1: Flowchart of the methodology adopted.

Results

Our findings give a clear picture of prevalence of HBV and HCV during the 2016-2023 in Pakistan. We have organized our findings into High risk, low risk and intermediate risk population. Low-risk population includes the general population which includes pregnant women, blood donors, children, refugees.

Low and High-risk populations

Low-risk population (General population)

Pregnant women: Complications of pregnancy elevate with this

viral infection like placental abnormalities, gestational diabetes, preterm labor and even death [4]. Estimated risk of gallstone formation is about 6% in pregnant women with hepatitis [5]. HBV infection passes on from mother to child natal at birth and postnatally via breastfeeding [6]. Viremic mothers can transmit HCV infection to their newborns at a probability of 3.2% [7]. Higher prevalence of this infection in pregnant women owe to surgeries, injections and blood transfusions. Findings of studies that have been carried out to investigate the prevalence of HBV and HCV in Pakistani pregnant women are tabulated in Table 1.

Table 1: Prevalence of HBV and HCV in pregnant women of Pakistan.

Study area	Year	Sample size	Infection type	Positive cases	References
People’s Medical college, Nawab shah	2017	3020	HCV	102	[8]
Hayatabad Medical College complex, Peshawar	2022	1055	HCV	442	[9]
CMH, Hyderabad	2020	1769	HCV	129	[6]
Jinnah Postgraduate Medical Center, Karachi	2023	332	HBV	HBV (68)20.5%	[10]
			HCV	HCV (48)14.5%	

Blood donors: Blood donors are more susceptible to acquire this blood-borne infection than non-blood donors as they encounter several transfusion transmissible infections while syringe piercing for donating blood. A review reports HBV weighted average of 11 studies to be 2.41% while HCV weighted average of 13 studies was 3.31% as estimated till 2019 [11].

High risk clinical population

Thalassemia Patients: Almost 5-7% population is suffering from this hereditary disease in Pakistan. Owing to the anemic condition of such patients, blood transfusion on regular basis is mandatory. Blood transfusions become a vector of HBV and HCV infection in Thalassemic patients. A recent study reports the prevalence of HBV in thalassemic patients at CMH, Rawalpindi during 2021-2022. A study revealed that 5 patients out of 100 patients had active HBV [12].

Dental Procedures: Seropositivity of HBV and HCV was investigated in Azad Jammu and Kashmir, Pakistan during 2022. Dental procedures were found to be a major contributor to these infections. 107 cases out of 317 participants (i.e., 61.9%) positive HBV patients had dental surgeries [13]. Other high-risk populations include patients of hemophilia, hemodialysis and all others who receive blood transfusions. Barbers are also at high risk of acquiring HBV and HVC infection via razors, combs, blades etc.

Intermediate Risk population: Health workers, Patients of Diabetes mellitus, prisoners and household contacts of HCV-

infected patients are at intermediate risk. Reuse of needles, improper sterilization of medical instruments, unscreened blood, tattooing and nose/ear piercing are the intermediate risk factors.

PWID (People who inject drugs): People who are addicted to drugs inject themselves frequently with reused syringes. They acquire HIV and other infections like HCV and HBV. An investigation reported that 5% of PWID with HIV were positive for HBV and 50% were having HCV [14]. People with chronic liver diseases who are hospitalized are also at risk to get viremic with HCV and HBV because of exposure to unhygienic environment. H. Qureshi et al. reported 10-46% CLD patients had HBV and 40-86% had anti-HCV in their study about the prevalence of HBV and anti-HCV in Pakistan [15].

Geographical prevalence of HBV and HCV in Pakistan

Prevalence of these infectious ailments varies in different geographical settings. A study conducted retrospective analysis to estimate the serological prevalence of HCV in population of Punjab, Pakistan in 2017. 5 districts: Khanewal, Faisalabad, Okara, Sheikhpura and Nankana Sahab were identified with higher seroprevalence [16]. The seroprevalence of districts are mentioned in Table 2. Ahmad M et al. screened 300 individuals from Arifwala, Punjab, Pakistan for HBV and anti-HCV and found the prevalence of HBV and HCV as 10% and 14% respectively [17]. Mahmud et al. characterized the HCV epidemic in Pakistan and his findings about prevalence of HCV in provinces of Pakistan are mentioned in Table 3 [18].

Table 2: Serovalence of HCV in Punjab, Pakistan monitored in 2017.

Year of Publication	Area of study	Infection Type	Seroprevalence (%)	Reference
2017	Attock	HCV	5.8	[16]
2017	Bahawalnagar	HCV	5.9	[16]
2017	Bahawalpur	HCV	9.4	[16]
2017	Bhakkar	HCV	11.4	[16]
2017	Chakwal	HCV	7.7	[16]
2017	D.G.Khan	HCV	6.6	[16]
2017	Faisalabad	HCV	25.1	[16]
2017	Gujranwala	HCV	21.6	[16]
2017	Gujrat	HCV	7.4	[16]
2017	Jehlum	HCV	10.2	[16]

2017	Jhang	HCV	21.2	[16]
2017	Kasur	HCV	16.2	[16]
2017	Khanewal	HCV	45	[16]
2017	Lahore	HCV	14.3	[16]
2017	Multan	HCV	15.9	[16]
2017	Nankana Sahib	HCV	37.1	[16]
2017	Okara	HCV	31.2	[16]
2017	Sheikhupura	HCV	36.8	[16]

Table 3: HCV prevalence in provinces of Pakistan.

Year of Publication	Province of Pakistan	Prevalence (%)	# of chronically infected people	Reference
2019	Punjab	5.6%	4228702	[18]
2019	Sindh	7%	2300829	[18]
2019	KPK	6.6%	1382782	[18]
2019	Balochistan	5.8%	491446	[18]
2019	F.A.T.A	0.9%	30898	[18]

Genotypic distribution

6 major HCV genotypes (1-6) and few sub-types (denoted alphabetically like 3a) have been known [19]. These genotypes are distributed differently in ethnic groups and geographical settings of Pakistan. Several studies have characterized the HCV genotypic distribution in Pakistan. Umer M. et al. conducted a systematic

survey to characterize HCV genotypes and results of each genotype with percentage are shown in chart of Figure 2 [20]. Another study investigated the genotypic distribution in responders, relapsers and non-responders. It was found that 84% of Genotype 3a was common in responders, Genotype 1a was abundant in relapsers (66%) [21].

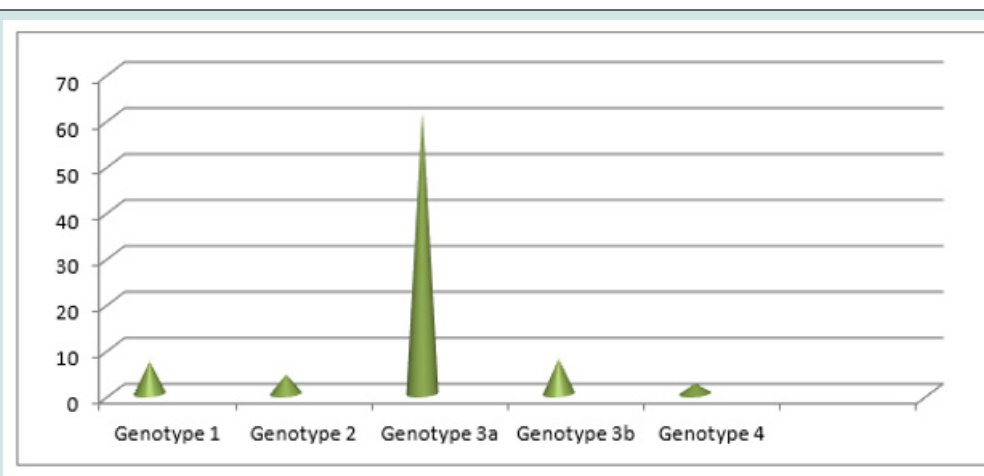


Figure 2: Genotypic distribution of HCV in Pakistan.

Conclusion

Pakistan’s epidemic of HBV and HCV is rising alarming, infecting newborns, pregnant women, individuals getting blood transfusions, barbers, health professionals and prisoners. Poor hygienic habits and less vaccination awareness render HBV and HCV the havoc for the population. Genotypic distribution and geographical prevalence are highlighted in the study. Scale up of preventive and treatment measures need to be done to eliminate this blood-borne killer.

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