

PREVALENCE OF HEPATITIS B & HEPATITIS C AMONG PATIENTS UNDERGOING CATARACT SURGERY AT A TERTIARY CARE HOSPITAL IN PAKISTAN: A RETROSPECTIVE CHART REVIEW

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ABSTRACT

PURPOSE: The study was carried out to assess the prevalence of Hepatitis B and Hepatitis C in patients presenting for Cataract Surgery.

MATERIALS AND METHODS: This study was designed as a retrospective chart review. After approval from the Institutional Review Board, the study was conducted at Govt. Allama Iqbal Memorial teaching Hospital affiliated with Govt. Khwaja M Safdar Medical College, Sialkot. All the cases undergoing cataract surgery from 08-2017 to 11-2019 were included in the study. A total of 1249 patients between the ages of 30-70 years were studied among which 597 (47.8%) were male, while 652 (52.2%) patients were female. Rapid Chromatography immunoassay was used for the qualitative detection of the surface antigen of Hepatitis B (HBsAg). For hepatitis C, antibody detection (anti-HCV) was the screening technique used to assess the patients.

RESULTS: In our study group, the total combined prevalence of HBV and HCV was found to be 15.6%. 13.1% patients were positive for the Hepatitis C antibody (anti-HCV) and Hepatitis B surface Antigen (HbsAg) was detected in 2.5% of our patients.

CONCLUSION: The high prevalence shown by our study results warrants strict implementation of safety protocols to limit the spread of these two viruses, especially in patients presenting for various ophthalmic procedures.

KEY WORDS: Cataract, Hepatitis B, Hepatitis C

INTRODUCTION

Hepatitis B (HBV) and Hepatitis C (HCV) are global public health problems that remain a significant cause of morbidity and mortality, especially in developing countries. These highly contagious diseases are caused by viruses targeting the liver cells, causing acute and chronic infection and, at times, malignant transformation of liver cells.^{1,2} In 2010, a study by Qureshi H. estimated that the prevalence of HBV in Pakistan is 2.8%, while that of HCV is 4.8%. The main modes of transmission of the Hepatitis B are vertical transmission from mother to child during childbirth or through direct contact with blood or other bodily fluids during surgery or other medical procedures. Whereas, Hepatitis C is transmitted through blood, mainly by injectable drug abuse, unsafe handling of blood or blood products, and contaminated surgical instruments.¹⁻³ In 1990, Temel A⁴ detected Hepatitis B surface antigen in the tear film and aqueous humour of

patients while In 1997, Hepatitis C RNA fragments were extracted from 70 percent of tear films and in 75.6 percent of aqueous humor tested by Medel⁵ in his study.

Cataract is the most common cause of avoidable blindness world over.⁶ It has been projected that cataract related blindness in Pakistan will have affected about 1,210,000 people by the end of the year 2020.⁷ Various studies in the recent past have observed that among health care professionals, ophthalmologists sustain the highest number of sharp injuries.⁸⁻¹⁰ This signifies the great magnitude of threat that is specifically faced by ophthalmologists when they perform various surgical procedures, especially cataract surgery. According to the World Health Organization (WHO), the cataract surgery rate (CSR) in Pakistan is estimated to be 4000/million population for the year 2020.⁷ This large number implies that a colossal patient

burden is placed on the surgical facilities at one point, making it essential to have a well-devised plan in place against viral transmission through cross-contamination.

As most of the infected patients are asymptomatic, they pose a severe threat of cross-infection, not just to healthcare personnel but also to other patients sharing the same space.¹¹ Therefore, we planned this study to assess the prevalence of HBV and HCV in patients presenting for cataract surgery, to conduct a needs assessment for the adoption of specific preventive measures in the perioperative period.

MATERIALS AND METHODS

This study was designed as a retrospective chart review. After approval from the Institutional Review Board, the study was conducted at Govt. Allama Iqbal Memorial teaching hospital affiliated with Govt. Khwaja M Safdar Medical College, Sialkot. All the cases undergoing cataract surgery from 08-2017 to 11-2019 were included in the study. Rapid Chromatography immunoassay was used for the qualitative detection of the surface antigen of hepatitis B (HBsAg). For hepatitis C, antibody detection was the screening technique used to assess the patients.

The collected data was analysed using the Statistical Package for Social Sciences (SPSS) version 23. The qualitative data has been expressed as frequency, percentage, and mode deviation, whereas quantitative data has been presented as a range, mean and standard deviation. The Association between age group and gender with the prevalence of HBV and HCV is assessed using the Chi-Square test with a significant p-value of <0.05.

Results

A total of 1249 patients were included in the study, with their ages ranging from 30 -70 years of age. The mean age of subjects was 56.79±9.706 years, while the mode was 60 years of age. Within age groups, 106 (8.5%) patients were from 30-40 years, 288 (23.1%) from 41-50 years, 444 (35.5%) from 51-60 years of age, while 411 (32.9%) patients were from 61-70 years of age. **(Table 1, Figure1)**

Among the patients, 597 (47.8%) were Male, while 652 (52.2%) patients were Female. **(Table 2, Figure 2)**

Table 1:

Age -group (Years)	Frequency (n)	%age Prevalence
30-40	106	8.5
41-50	288	23.1
51-60	444	35.5
61-70	411	32.9
Total	1249	100.0

Figure 1: Age Distribution of Patients:

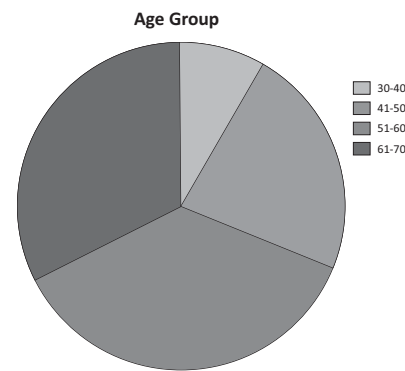
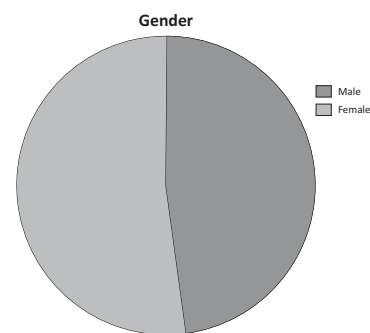


Table 2 : Gender Distribution of Patients

Gender	Frequency (n)	%age Prevalence
Valid Male	597	47.8
Female	652	52.2
Total	1249	100.0

Figure 2 : Gender Distribution of Patients



The total combined prevalence of HBV and HCV was found to be 15.6%.

For Hepatitis C, 164 (13.1%) patients were positive for the Hepatitis C antibody, while the remaining 1085 (86.9%) patients had a negative Anti-HCV result. (Table 3 Figure 3).

For Hepatitis B, 31 (2.5%) patients were positive for Hepatitis B surface antigen (HBsAg), while 1218 (97.5%) patients were negative for the HBsAg. (Table 3 Figure 4).

Table 3: Frequency of HbsAg + and Anti HCV +ve patients

	HBs AG		Anti HCV	
	Frequency (n)	Percentage %	Frequency (n)	Percentage %
Positive	31	2.5	164	13.1
Negative	1218	97.5	1085	86.9
Total	1249	100.0	1249	100.0

Figure 3: Frequency of Anti HCV +ve patients

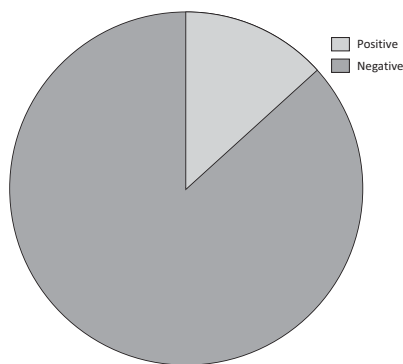
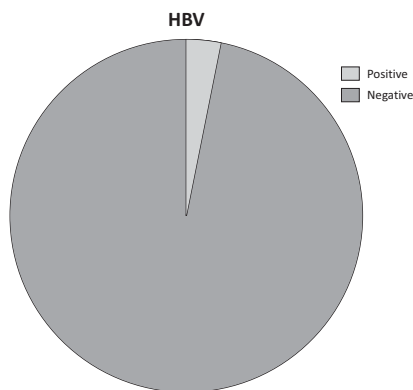


Figure 4: Frequency of HBsAg +ve patients



Upon descriptive statistical analysis, it was found that 6.5% of HBV cases were from the 30-40 age group, 16.1

% from 41-50 age group, 29.0% from 51 – 60 age group, while 48.4% were from the 61-70-year age group.

Anti-HCV was found positive in 4.9% of cases who were from 30-40 years of age group, 21.3 % from 41-50 age group, 34.1% from 51 – 60 age group, while 39.6% were found in the 61-70-year age group.

There was no statistically significant association found between the patients' age and the prevalence of Hepatitis B or C among them with a p-value of 0.541 and 0.439, respectively. Table 4 Figure 5,6

Table 4: Age groups and prevalence of Hepatitis B and Hepatitis C

Age Group	HBs AG			Anti HCV		
	Positive	Negative	Total	Positive	Negative	Total
	30-40	2 (1.89%)	104 (98.1%)	106	8 (7.54%)	98 (92.46)
41-50	5 (1.73%)	283 (98.26)	288	35 (12.15%)	254 (87.85)	288
51-60	9 (2.02%)	435 (97.97)	444	56 (12.61)	388 (87.39)	444
61-70	15 (36.49%)	396 (96.35%)	411	65 (15.81%)	346 (84.18%)	411
Total	31 (2.48%)	1218 (97.52%)	1249	164 (13.13%)	1085 (86.8%)	1249
Chi square vale-2.149			Chi square vale-2.705			
P-Value - 0.541			P-Value - 0.439			

Figure 5:

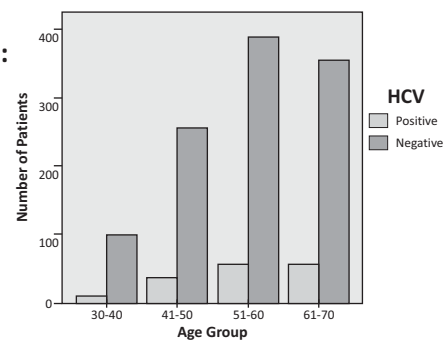
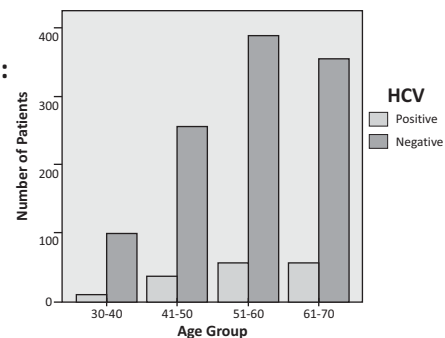


Figure 6:



Among the patients in the HBV group, 51.6% of patients were male, and the remaining 48.4% of patients were Female. Gender did not have any statistically significant association with the presence of HBsAg, with a p-value of 0.667.

In the case of HCV, 47% of patients were male, while 53% were Female. There was no statistically significant association found between presence HCV Ab and any gender with a p-value of 0.816. *Table 5, Figure 7,8*

Table 5: Gender based prevalence of Hepatitis B and Hepatitis C

		HBsAg			Anti HCV		
		Positive	Negative	Total	Positive	Negative	Total
Gender	30-40	16	581	597	77	529	597
	41-50	15	637	652	87	565	652
	Total	31	1218	1249	164	1085	1249
		Chi Square Value-0.370			Chi Square Value-0.005		
		P-Value - 0.543			P-Value - 0.946		

Figure 7

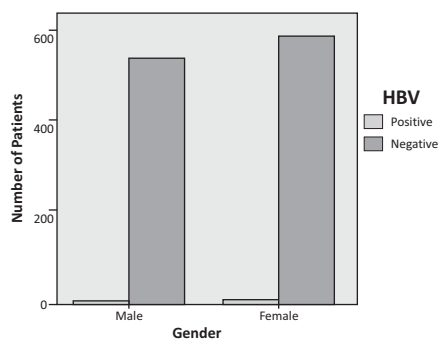
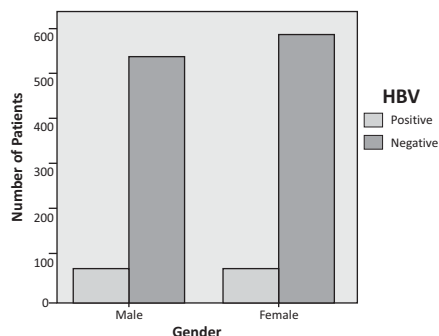


Figure 8:



DISCUSSION

Viral hepatitis is the seventh leading cause of death worldwide, with close to 1.34 million fatalities in the year 2015. Around 95% of patients presenting to hospitals with acute hepatitis, hepatitis-related cirrhosis, or liver cancer have underlying HBV or HCVinfection. According to the World Health Organization (WHO) estimates, globally, the number of people currently affected by Hepatitis B and Hepatitis C are over 257 million and 71 million, respectively.¹² It has also been projected that if the current infection rates continue, an estimated 20 million deaths will occur worldwide between 2015 to 2030. Within the Eastern Mediterranean Region (EMRO), supervised by the WHO, Egypt and Pakistan share almost 80% of cases, with the number of Hepatitis B cases approaching 21 million and Hepatitis C affecting about 15 million people in 2016.¹² In Pakistan alone, around 12 million people are estimated to be affected by either Hepatitis B or C, with an annual incidence reaching an alarming number of 150,000 new cases per year.¹³ Various studies previously performed in Pakistan have revealed a general prevalence of 10% for HBV and of about 5-10% for HCV in the general population.¹⁴ Moreover, the disease spread has been noticed to be in a non-uniform manner where the rural population has significantly more cases than the urban population.¹⁵

These appalling numbers have prompted recognition of these two viruses as a global public health problem resulting in the adoption of the Sustainable Development Goal Agenda (SDG) by the United Nations and the implementation of the Global Health Sector Strategy (GHSS) by the WHO in 2016. The goals of GHSS aim to reduce the incidence of viral hepatitis by 90%: and the hepatitis-related mortality to 65% by the year 2030.¹⁶ However, according to a progress report published by WHO, only 161,000 people were treated for HCV in Pakistan in the year 2016,¹⁷ whereas to achieve the GHSS targets, the number of treated cases needs to reach at least 880,000 per year. These numbers highlight a dire need for more robust surveillance strategies first to diagnose and subsequently to prevent the transmission of these viruses, both in the general population as well as in the healthcare sector.

In our study conducted on the patients presenting for

cataract surgery, the total combined prevalence of HBV and HCV was found to be 15.6%, which is similar to the ones found by Naeem et al. 12.99%, and Lohano et al. 15.36%¹⁸ for the cities of Karachi and Hyderabad, respectively.

For Hepatitis B, the prevalence was found to be 2.5% in the patients presenting to us for cataract surgery, which is similar to 2.1% reported by Naeem et al.¹⁵ in a comparable study population and is predictably lower than those indicated by Memon et al. (3.1%)¹⁹ performed in the higher risk group patients.

We also noticed an incremental increase in prevalence with the age of patients where we observed that percentage of HbsAg positive individuals was found to be about 48.4% within the age group of 61-70 years, 29.0% within the age group of 51-60 years, 16.1% within 41-50 years while only 6.5% were from the 30-40-year-old group. (**Table 4.**) Such similar trends have also been observed previously in studies by Lohano¹⁸ and Talpur.²⁰ This trend may be attributed to the relatively greater exposure of the older population to Hepatitis B when there was little understanding of disease mechanisms and various modes of transmission. However, this trend needs to be further explored in multi-centre studies to establish a definite association.

Though previously done studies have shown either gender predilection,^{18,21} our study did not observe any significant difference between the two genders with regards to HBV prevalence. This may indicate that both males and females are equally exposed to the known risk factors of transmission contrary to popular belief that males may have a higher prevalence because of more social activity and mobility.

The prevalence of Hepatitis C in our semi-urban centre was 13.1% which is similar to the one performed by W Ul Huda et al.²² in Karachi (a major urban city) where it was reported as 17.3%. Another study that was performed in 2009 showed a prevalence of 29.6% in the city of Hyderabad that may be indicative of higher prevalence in that particular locality.²¹ We also found increasing prevalence with age where the disease prevalence in the higher age groups was found to be greater than in the ones with lower age groups. Similar to Hepatitis B, there was no gender predilection towards either sex regarding Hepatitis C prevalence.

The relative incremental increase in the prevalence of

either HBV or HCV with age is indicative of greater involvement of the older population in traditional high-risk practices including but not limited to shaving at barbers, ear-nose piercings or surgeries performed in poorly sanitized conditions. The community at large needs to be counselled regarding these traditional practices and the threat they pose in the transmission of viruses.³

One possible cause of lack of gender variation in the prevalence of HCV may be high 'community' exposure to unsafe administration of injections.³ This emphasizes the need for implementation of safe injection practices such as discouraging the use of multi-dose vials, both in the government hospitals as well as in the private sector.

In addition, the threat of greater transmission of either virus during surgeries consolidates the need for better surgical care. A meta-analysis of data from 1989-2016 in Pakistan indicated that HCV transmission was primarily related to healthcare-related procedures not only including unsafe injection practices but also intravenous infusions and inadequate sterilization of medical equipment.²³ Quite interestingly, the analysis also indicated that the "relative" (as opposed to absolute) role of injection drug abuse and other community-based exposures might, in fact, be smaller compared to healthcare-related procedures.²³ This role needs to be further explored in large multi-center analyses regarding the transmission of either virus.

Among healthcare workers, ophthalmologists, in particular, have been found to sustain the highest number of sharp injuries.⁸⁻¹⁰ During the performance of procedures like cataract surgery, they face greater responsibility of not only protecting themselves but also must ensure that transmission of potentially lethal infections like HBV and HCV does not occur among patients. The results of our study serve to raise awareness towards this precarious situation not only faced by the population at large in Pakistan but especially by healthcare personnel, particularly the ophthalmologists in our country. Therefore, adoption and implementation of various safety protocols is of utmost importance as they perform procedures on various high risk patients.

Our study was limited in scope as it did not involve individuals under 20 years of age. Patients were not

questioned about drug abuse, tattooing, or other high-risk sexual behaviours. Any previous surgical or transfusion history was not evaluated in this study, and a lack of consideration of these factors may have influenced the results.

CONCLUSION

As Pakistan strives to meet GHSS goals set by WHO for 2030, it is of utmost importance to adopt effective policies for disease control, specifically in the health care sector. This includes mandated vaccination against HBV for all health care workers and targeted counselling of high-risk groups on HCV. Once patients present to the surgical setting, a plan needs to be in place for proper triage of high-risk patients, so extra caution may be exercised by health care professionals while they are caring for such patients.

Through our observations, we suggest that further multi-center, multi-variate studies may be planned in the future to offer better recommendations for the adoption of 'specialty-specific' protocols in the health care sector, especially in ophthalmology.

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REFERENCES

1. Cao D. Color vision and night vision. 5th ed. Los Angeles: Elsevier Inc. 2012.1. World Health Organization. Hepatitis B (Fact Sheet) 2019 [updated 07-18-2019. Available from: <https://www.who.int/news-room/fact-sheets/detail/hepatitis-b>.
2. World Health Organization. Hepatitis C (Fact Sheet) 2019 [updated 07-09-2019. Available from: <https://www.who.int/news-room/fact-sheets/detail/hepatitis-b>.
3. Qureshi H, Bile KM, Jooma R, Alam SE, Afridi HU. Prevalence of hepatitis B and C viral infections in Pakistan: findings of a national survey appealing for effective prevention and control measures. *East Mediterr Health J.* 2010;16 Suppl:S15-23.
4. Temel A, Seber E, Gunay M. Detection of hepatitis B surface antigen in aqueous humor. *1990;68(2):205-8.*
5. Mendel I, Muraine M, Riachi G, El Forzli F, Bertin C, Colin R, et al. Detection and genotyping of the hepatitis C RNA in tear fluid from patients with chronic hepatitis C. *1997;51(3):231-3.*
6. Quillen DA. Common causes of vision loss in elderly patients. *Am Fam Physician.* 1999;60(1):99-108.
7. Jadoon Z, Shah SP, Bourne R, Dineen B, Khan MA, Gilbert CE, et al. Cataract prevalence, cataract surgical coverage and barriers to uptake of cataract surgical services in Pakistan: the Pakistan National Blindness and Visual Impairment Survey. *Br J Ophthalmol.* 2007;91(10):1269-73.
8. Rewri P, Sharma M, Lohan A, Singh D, Yadav V, Singhal AJJoo. Practice pattern of cataract surgeons when operating on seropositive patients. *2019;67(3):335.*
9. Mansour AM. Which physicians are at high risk for needlestick injuries? *Am J Infect Control* 1990;18(3):208-10
10. Adams S, Stojkovic SG, Leveson SHJOM. Needlestick injuries during surgical procedures: a multidisciplinary online study. *2010;60(2):139-44.*
11. Ahmad I KS, Hafeez-ur-Rehman, Khan MH, Anwar S. Frequency of hepatitis B and hepatitis C among cataract patients. *Gomal J Med Sci.* 2006;4(2):61-4.
12. Regional action plan for the implementation of the global health sector strategy on viral hepatitis 2017–2021 [Internet]. 2017. Available from: https://apps.who.int/iris/bitstream/handle/10665/258729/EMROPUB_2017_EN_19931.pdf?sequence=1&isAllowed=y.

13. Organization WH. WHO EMRO: Prevention and control of hepatitis - Pakistan [Available from: <http://www.emro.who.int/pak/programmes/prevention-a-control-of-hepatitis.html>].
14. Tahir MA, Cheema A, Tareen SJPjoms. Frequency of Hepatitis-B and C in patients undergoing cataract surgery in a tertiary care Centre. 2015;31(4):895.
15. Naeem SS, Siddiqui EU, Kazi AN, Khan S, Abdullah FE, Adhi I. Prevalence of hepatitis 'B' and hepatitis 'C' among preoperative cataract patients in Karachi. BMC Res Notes. 2012;5:492.
16. Global Health Sector Strategies on Viral Hepatitis 2016-2021. [Internet]. Available from: http://apps.who.int/gb/ebwha/pdf_files/WHA69/A69_32-en.pdf?ua=1.
17. Organization WH. Progress report on access to hepatitis C treatment, focus on overcoming barriers in low and middle income countries. March 2018 [Available from : <http://apps.who.int/iris/bitstream/10665/260445/1/WHO-CDS-HIV-18.4-eng.pdf?ua=1>].
18. Lohano MK, Su L, Narsani AK, Jawed M, Naveed HJBJoMP. Frequency of Hepatitis B surface antigen (HBsAg) and Hepatitis C antibody (HCVAb) seropositivity among preoperative eye surgery patients. 2016;9(2):5-9.
19. Memon AR, Shafique K, Memon A, Draz AU, Rauf MUA, Afsar S. Hepatitis B and C prevalence among the high risk groups of Pakistani population. A cross sectional study. Archives of Public Health. 2012;70(1):9.
20. Talpur AA, Ansari AG, Awan MS, Ghumro AAJPs. Prevalence of hepatitis B and C in surgical patients. 2006;22(3):150-3.
21. Nangrejo KM, Qureshi MA, Sahto AA, Siddiqui SJJJoO. Prevalence of Hepatitis B and C in the patients undergoing cataract surgery at eye camps. 2011;27(1).
22. ul Huda W, Jameel N, Fasih U, Rehman A, Shaikh AJJoO. Prevalence of hepatitis B and C in urban patients undergoing cataract surgery. 2013;29(3).
23. Al Kanaani Z, Mahmud S, Kouyoumjian SP, Abu-Raddad LJ. The epidemiology of hepatitis C virus in Pakistan: systematic review and meta-analyses. R Soc Open Sci. 2018;5(4):180257.