

Original Research Article

Seroprevalence and associated risk factors of hepatitis B virus infection among barbers of south west district of Delhi, India: a cross-sectional study

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ABSTRACT

Background: Hepatitis B virus (HBV) infection continues to pose a significant public health challenge globally. The burden of HBV infection extends beyond the medical community to include individuals in various occupations, including barbers. Barbers, as a unique occupational group, may be at an increased risk of HBV transmission due to frequent contact with blood and bodily fluids during haircutting and other grooming procedures.

Methods: A cross-sectional study was conducted among 300 barbers of South West district of Delhi through multi stage random sampling technique. RAPID HBsAg test kit was used to determine the seroprevalence of HBV infection among the participants. The data obtained were analysed and interpreted using both descriptive and inferential statistics.

Results: The RAPID HBsAg Card test detected a seroprevalence rate of 2% among barbers, which is higher than the national average (0.95%). Significant risk factors included improper use of protective equipment (100%), lack of vaccination against Hepatitis B virus infection (95.67%), exposure to blood/injuries (79.66%), and improper waste disposal (55.33%). A significant association was found between seroprevalence and associated risk factors like exposure to cut/injury and history of high-risk situation. A significant association was found between HBV infection with age, marital status, and years of experience.

Conclusions: The findings underscore the urgent need for targeted public health interventions, including mandatory HBV vaccination, improved infection control training, and regular screening programs for barbers, to reduce the transmission risk and contribute to India's hepatitis elimination goals.

Keywords: Seroprevalence, Associated risk factors, Barbers, Hepatitis B virus infection

INTRODUCTION

Hepatitis B, a viral infection that targets the liver is a major public health problem worldwide which can result in both acute and chronic illness. It is the second leading

infectious cause of death globally with 1.3 million deaths per year, the same as tuberculosis.¹ With a person dying every 30 seconds from a hepatitis-related illness, we must move more quickly to improve prevention, diagnosis and treatment of hepatitis-related illnesses.²

The most prevalent diseases among Hepatitis i.e., HBV and HCV, cause 2.2 million new infections annually. Testing and treatment coverage rates have stagnated in spite of improved diagnostic and treatment techniques and falling product costs. However, if quick action is taken today, it should still be possible to accomplish the WHO elimination goal by 2030.² Barbers' work involves using blades and razors, which exposes them to clients' blood when shaving customers' hair. HBV has a lower infectious dosage and it is 50–100 times more contagious than HIV and 10 times more contagious than the hepatitis C virus (HCV).³

India is dedicated to controlling other virus-induced hepatitis and gradually moving towards the eradication of viral hepatitis B and C. This is consistent with the worldwide commitment to accomplishing Sustainable Development Goal (SDG) target 3.3, End the epidemics of AIDS, tuberculosis, malaria and neglected tropical diseases and combat hepatitis, water-borne diseases and other communicable diseases. In an effort to eradicate viral hepatitis by 2030, the 69th World Health Assembly adopted the WHO Global Health Sector Strategy on Viral Hepatitis 2016–2021, which the Indian government signed.⁴

The high prevalence rate of the virus in India suggests that there is a huge reservoir of infection, which is continuously spreading the virus and resulting in new HBV infections. As per Current Practice Guidelines (CPGs) of the European Association for the Study of the Liver, Asian Pacific Association for the Study of the Liver, and American Association for the Study of Liver Diseases, individuals aged >30 to 40 years with immune active (IA) chronic hepatitis evidenced by raised alanine aminotransferase (ALT), increased fibrosis (by non-invasive elastography), necroinflammation on biopsy, or presence of cirrhosis and decompensation are treated. The window of opportunity for treatment is short, and all patients require a strict 3- to 6-month follow-up, with surveillance for HCC, regardless of drug therapy. Unless we expand access to care, we will fail to meet the elimination milestones set by the WHO not just in India but globally.⁵

Objectives of the study

To assess the seroprevalence and associated risk factors of HBV infection among barbers. To seek the association of seroprevalence of Hepatitis B virus infection among

barbers with associated risk factors. To seek the association of seroprevalence of HBV infection among barbers with selected socio-demographic variables: - Age, Religion, Marital Status, Educational Status, Economic Status, Work experience.

METHODS

A survey approach with descriptive and cross-sectional survey design was used. A total of 300 barbers who are currently working were selected from 93 barbershops of the South West district of Delhi through multi stage random sampling technique. RAPID HBsAg test kit was used to determine the seroprevalence of HBV infection among the participants.

Data collection tools and techniques

Data was collected using the tools, Structured Risk Factor Assessment Proforma and Serological test assessment Proforma. The content validity of the tools was established by giving it to 15 experts from the field of Community Medicine, Transfusion Medicine, Microbiology and Community Health Nursing. The reliability of Structured Risk factor assessment Proforma (0.81) by Cronbach alpha and RAPID HBsAg Card (0.99) by inter-rater reliability. After obtaining formal administrative approval from appropriate authority the final study was conducted from 24th January 2024 to 19th February 2024 in South-west district of Delhi.

Sample size

300 obtained from the Raosoft sample size calculator software.

Sampling technique

For the present study the multi-stage random sampling technique was used for selecting barbershops and barbers.

Stage I- Two sub-divisional areas of South-West district of Delhi were randomly selected through lottery method.

Stage II- Further 10 areas of these two subdivisions were randomly selected.

Stage III- All barbers who are willing to participate and working in these 10 areas of barbershops has been selected.

Table 1: Data collection.

S. no.	Tools	Purpose	Technique
1	Tool I: Structured Risk Factor Assessment Proforma		
	Part A: Socio-demographic profile	-To assess the personal information	Interviewing
	Part B: Risk factor assessment proforma	-To assess the associated risk factors of HBV infection	Interviewing
2	Tool II: Serological test assessment proforma	-To assess the seroprevalence of HBV infection	Blood test (RAPID HBsAg Card)

Table 2: Raosoft sample size calculator software.

RAOSOFT	
Margin of error can you accept	5.62%
Confidence level	95%
Population size (Use 20,000 if not known)	20,000
Response distribution	50
Recommended sample size	300

Through multi-stage random sampling technique, 2 areas of South West district of Delhi were i.e., Kapashera and Najafgarh sub-divisions were randomly selected from the three administrative subdivisional areas, later 10 areas from each of these two sub divisions were again randomly selected, further all barbershops from these areas has been selected whoever willing to participate.

Self-introduction and establishment of a rapport with participants were done. The researcher explained the nature, purpose and their expected participation in the study. Written consent has been taken from all the participants. The subjects were assured confidentiality of their responses and their result of RAPID HBsAg Card test. Data collection was done through face-to-face interview and seroprevalence was assessed using RAPID HBsAg Card kit. Positive results of RAPID HBsAg Card test were disclosed confidentially to the subjects. Barbers turned positive in RAPID HBsAg Card kit were given counselling and given assistance to do confirmatory test (ELISA/NAT/CLIA) and further to undergo HIV testing. All subjects turned positive in RAPID HBsAg Card kit were given a referral letter and instructed to consult Gastroenterology Department (Infectious Disease Clinic) of AIIMS New Delhi/ Indira Gandhi Hospital, Dwarka Sector-9 and were followed up weekly to check the confirmation test and referral consultation during the data collection period. Family screening was advised to all barbers tested positive. Subjects turned negative and not vaccinated against HBV infection were motivated and given a referral letter for HBV shot from the nearby Delhi Government Hospital for a 3-dose vaccination.

Serological test was performed in all subjects using RAPID HBsAg test kit, fingertip pricking has done with the help of a sterile lancet, one drop of blood squeezed with the help of the plastic pipette and poured into the well of testing card kit and added one drop of buffer solution and report was read after 10-15 minutes. RAPID HBsAg test kit was placed on a safe and flat surface, during the waiting time risk factor assessment proforma data was collected. Bio-medical waste (BMW) generated has been disposed on daily basis at the Delhi Government Health Centre, Raj Nagar Part II after taking prior approval from the CMO In-charge. Time taken for the completion of each interview was 40-45 minutes.

RESULTS

The sample characteristics revealed that the majority (59.67%) of barbers were in the age group 18-28 years, 54.67% were unmarried. 36% of barbers were having high school as educational qualification, 44.67% were having personal monthly income between Rs. 15,001-20,000. Majority (66.67%) of the barbers belongs to Islam religion, 35.33% were having an experience of 12 years and above, 80% of them didn't undergo any vocational training to work as barber. 32.67% of barbers considering this job as ancestral job. Most (82.33%) of barbershops were located in the urban area.

The results revealed a seroprevalence rate of 2%, a relatively high prevalence of Hepatitis B among barbers compared with national seroprevalence (0.95%) indicating a substantial burden of HBV infection among barbers in the South West district of Delhi (Figure 1).

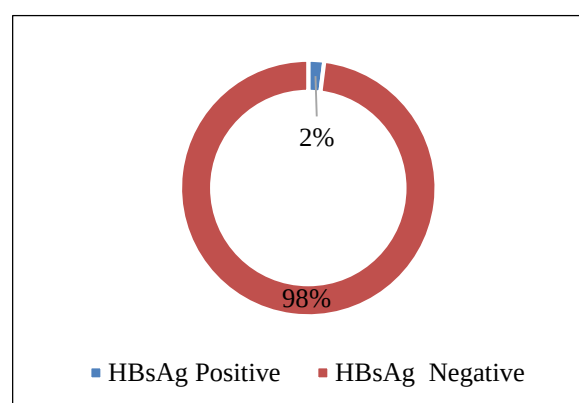


Figure 1: Doughnut showing percentage distribution of barbers according to their serological status of HBV infection.

The major risk factors found were that, most (95.67%) of barbers were not vaccinated against HBV, none (100%) of the barbers were using proper personal protective equipment, majority (79.66%) of barbers were exposed to blood while on job. 52% of the barbers experienced cut or injury while working. 75% of barbers were not practicing proper post exposure prophylactic management, majority (88%) of barbers were using alum bars on cuts after hair cutting/shaving, most (55.33%) of barbers were not disposing used articles and waste properly. Majority of respondents (53.97%) reported exposure to blood, cut/injury on monthly basis. Most of barbers (35.98%) reported washing the exposed area with Dettol an antiseptic disinfectant, 31.38% reported washing the exposed area with soap and water. A notable proportion of barbers (15.89%) reported doing nothing after experiencing a cut or exposure to blood and none of the barbers consult a doctor or seek medical advice upon post exposure. Most (57.74%) of barbers exposed to blood while shaving whereas 30.96% reported on hair cutting.

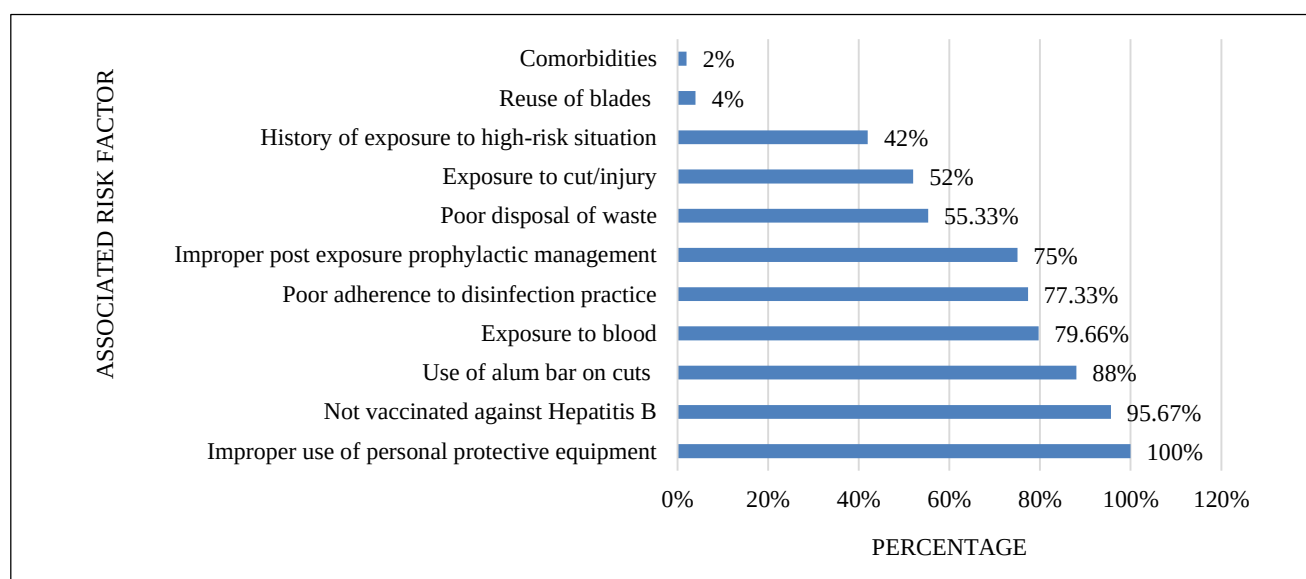


Figure 2: Percentage distribution of associated risk factors of HBV infection among barbers.

A significant association was found between HBV seroprevalence and variables such as age, marital status, and years of experience. Risk factors like exposure to blood/injury and history of high-risk situations were also significantly associated with HBV infection.

DISCUSSION

Sample characteristics

The distribution of sample subjects by age shows that majority (59.67%) of barbers belongs to the age group 18-28 years, maximum (46.67%) of sample were residing in urban area and most (35.33%) of the barbers were having above 12 years of work experience, most (95.67%) of barbers are not vaccinated whereas only 4.33% are vaccinated against Hepatitis B virus infection. These findings are similar to results reported by Shaikh et al, the mean age of respondents was 28+10 years, mean years of experience in barbering was 12.7+10.⁶ Majority of the respondents (84.8%) were resident of urban areas. Only 6.1% had been vaccinated against the hepatitis B.

Another study conducted by Hussain et al, revealed that mean age of study population was about 28.12±10.50 years with minimum and maximum age 14 and 65 years respectively.⁷ All the barbers participated in study were male with working experience of 11.58±8.72 years with 57% having work experience less than 10 year

Prevalence of HBV among barbers

The present study indicates that 2% of the barbers were found to be positive in RAPID HBsAg Card Test. These findings are also consistent with findings by Abbasi et al, reported a prevalence of HBV among barbers as 2.1%.⁸ However the prevalence of HBV among barbers was lower compared to the available national figures for the

prevalence among the general population of Pakistan. But the present study done in India suggests a relatively high prevalence of Hepatitis B among barbers (2% tested positive) compared with national seroprevalence (0.95%) and with Delhi, Haryana, Punjab, Chandigarh (Group 9) prevalence of 0.48-0.64% as per the National Program for Surveillance of Viral Hepatitis.⁹

Associated risk factors of HBV infection among barbers

The present study indicates that poor use of personal protective, not vaccinated against Hepatitis B, use of alum bar were the most reported associated risk factors of Hepatitis B infection among barbers. These finding were consistent with study conducted by Kriengkrai et al, which identified independent risk factors for HBV infection as lack of Hepatitis B vaccination, history of needlestick injuries, and poor adherence to infection control practices were significantly associated with HBV infection among barbers.¹⁰ The study underscores the importance of implementing preventive measures, including vaccination and safety protocols, to reduce HBV transmission risks in barbershops.

The present study was limited to 300 barbers of Southwest District of Delhi that posing restriction to make a broader generalisation. Study Sample were restricted to only one setting and did not assess confirmatory blood investigations like ELISA/CLIA/NAT which could have provided more reliability on seroprevalence. The information collected from Barbers was based on their exposed responses. Participants might provide socially acceptable responses leading to potential underreporting of high-risk behaviours.

CONCLUSION

The study highlights a significant public health concern and the findings indicate a notable prevalence of HBV infection among barbers, emphasizing their occupational vulnerability due to frequent exposure to blood and improper use of PPE. Key risk factors identified include limited vaccination coverage among barbers and improper use of PPE. The study underscores the urgent need for targeted interventions, including awareness campaigns, mandatory vaccination programs, and strict adherence to infection control measures in barbering practices.

Strengthening public health policies by integrating occupational health training and providing accessible vaccination services can play a crucial role in reducing the HBV burden among this high-risk group. Further research is recommended to evaluate the effectiveness of such interventions and to expand the scope of similar studies to other informal occupational groups at risk.

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Conflict of interest: None declared

Ethical approval: The study was approved by the research committee of R.A.K College of Nursing in October 2023

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