



Seropositivity, Sociodemographic Status and Risk Factors of HBV & HCV among Rohingya-Forcibly Displaced Myanmar Nationals and Their Accompanying Relatives

A H M Tharakul Mazid^{1*}, M A Hassan Chy², A.H.M. Thafikul Mazid³, Minhazul Hoque⁴, Md Faruq⁵, Nirnoy Paul⁶, Parijat Biswas⁷, Rubaiat Sabrin⁸, Afsana Akter⁹

¹Medical Officer, 250 Bedded General Hospital, Chattogram, Bangladesh,

Email: ahmtharakulmazid@gmail.com,

Orcid ID: 0009-0008-6128-9625

²Professor (Retired), Department of Medicine, Chittagong Medical College Hospital, Chattogram, Bangladesh,

Email: drmahassan09@yahoo.com,

Orcid ID: 0000-0003-1659-7422

³Specialist (Medicine), Evercare Hospital, Chattogram, Bangladesh,

Email: thafikul0013@gmail.com,

Orcid ID: 0000-0002-5368-814X

⁴Assistant Professor, Institute of Health Technology, Chattogram, Bangladesh,

Email: dr.minhazulhoque@yahoo.com,

Orcid ID: 0009-0005-0386-2962

⁵Registrar (Medicine), Chittagong Medical College Hospital, Chattogram, Bangladesh,

Email: faruq0034@gmail.com,

Orcid ID: 0009-0007-2989-3286

⁶Medical Officer, Dhaka Medical College Hospital, Dhaka, Bangladesh,

Email: nirnoypaul.ctg@gmail.com,

Orcid ID: 0009-0009-5663-7629

⁷Senior Consultant (Medicine), Rangamati General Hospital, Rangamati, Bangladesh,

Email: drparijat.cmc@gmail.com,

Orcid ID: 0009-0006-5258-2358

⁸Medical Officer, Chattogram Metropolitan Hospital Limited, Chattogram, Bangladesh,

Email: swiftsabrin@gmail.com,

Orcid ID: 0009-0008-4968-2467

⁹Resident Medical Officer, Evercare Hospital, Chattogram, Bangladesh,

Email: afsanaakter778746@gmail.com,

Orcid ID: 0009-0005-0405-5484

*Corresponding author

Received: 30 October 2023

Revised: 02 January 2024

Accepted: 21 January 2024

Published: 29 February 2024

Abstract

Background: Forcibly displaced Myanmar nationals (FDMN) migrated popularly known as Rohingya migrated to Bangladesh which has become an overburden for an already overpopulated country like Bangladesh. On the other hand, Hepatitis B, Hepatitis C infections are major health problems globally. Every year many new infections are being reported worldwide. This study aimed to assess the seropositivity, sociodemographic status, and risk factors of HBV & HCV among Rohingya-forcibly displaced Myanmar nationals and their accompanying relatives. **Material & Methods:** This cross-sectional observational study was conducted in the Department of Medicine, Surgery and Gynecology, Chittagong Medical College Hospital, Chattogram, Bangladesh, from May 2017 to January 2018. A total of 200 patients were selected as study subjects by purposive nonprobability sampling method. Data were collected in a preformed questionnaire. A descriptive analysis was done in this study. Data was analyzed using SPSS -IBM version 20. **Results:** A majority of the patients (111, 55.5%) were in the 25-50 years of age group. The median age of the study subjects was 29.50 years (range 8-80 years) (Mean 33.1±14.83 years), with a male-to-female ratio of 4.26:1. Regarding the presence of risk factors for getting HBV, HCV infections, the most prevalent factors were H/O circumcision (81%) and ear pricking (11.5%). Only 1.5% and 1% of patients had a history of unsafe sexual exposure and blood transfusion respectively. All of the 200 subjects were tested for HBV and HCV. Results showed that 13 patients (6.5%) and 15 patients (7.5%) were seropositive for HBV and HCV, respectively. **Conclusions:** This study concludes that forcibly displaced Myanmar nationals have a high frequency of seropositivity for Hepatitis B and Hepatitis C. Among them Hepatitis B virus is the most prevalent infection. This study also indicates that a history of unsafe sexual exposure and a history of unhygienic blood transfusion possess statistically significant associations with HBV and HCV seropositivity respectively.



Keywords:- Seropositivity, HBV, HCV, Forcibly displaced, Myanmar national (FDMN).

INTRODUCTION

Bangladesh has a long history of hosting Rohingya, the Muslim population from the Northern Rakhine State of Myanmar.^[1] Due to the recent violence in August 2017 instigated the migration of 6,93,000 additional Rohingyas into Bangladesh and as of June 2018, around one million Rohingya refugees were residing in Bangladesh.^[2] So far around one million Rohingya refugees have fled to Bangladesh, among which over 60% are children.^[3] As people who live close to one another, they spread diseases more quickly and easily and slums are extremely vulnerable to infectious diseases. So, it is highly likely to have an increased incidence of infections like Hepatitis B, and Hepatitis C in these refugee camps. Hepatitis B is an infectious disease caused by the Hepatitis B virus (HBV), a DNA virus of the Hepadna virus family that affects the liver. Hepatitis B is transmitted by exposure to infectious blood or body fluids. Infection around the time of birth or from contact with other people's blood during childhood causes chronic hepatitis B in 90% of cases while chronic hepatitis occurs in less than 10% of those who get infected after the age of five. Vaccination is recommended by the World Health Organization on the first day of life if possible.^[4,5] An estimated 300 million people are chronically infected with hepatitis B (defined as hepatitis B surface antigen positive for at least 6 months). More than 887000 people die every year due to complications of hepatitis B, including cirrhosis and liver cancer. The disease is most prevalent in the Western Pacific Region and the African Region, where 6.2% and 6.1%

respectively of adults are chronically infected.^[6] Hepatitis C, is a blood-borne RNA virus most commonly transmitted through unsafe injection practices, inadequate sterilization of medical equipment, and the transfusion of unscreened blood or blood products and sometimes through hemodialysis. Several cultural or ritual practices like circumcision, ear puncture, traditional tattooing, and acupuncture have been proposed as a potential mode of spreading for hepatitis C virus. Globally, about 71 million people have chronic hepatitis C infection and a significant number of those develop liver cirrhosis or liver cancer. Approximately 399000 people die each year from hepatitis C-related liver diseases. Antiviral medicines can cure approximately 95% of persons with hepatitis C infection, thereby reducing the risk of death from liver cancer and cirrhosis, but access to diagnosis and treatment is low. There is currently no vaccine for hepatitis C.^[7]

Objective

General Objective

- To assess the frequency of HBV, and HCV seropositivity among the forcibly displaced Myanmar nationals.

Specific Objectives

- To observe the sociodemographic status of the study subjects.
- To assess the risk factors of the respondents.

MATERIAL AND METHODS

This cross-sectional observational study was conducted in the Department of Medicine,

Surgery and Gynecology, Chittagong Medical College Hospital (CMCH), Chattogram, Bangladesh, from May 2017 to January 2018. Rohingya patients and their accompanying relatives admitted to different departments of CMCH were considered as the study population. A total of 200 patients were selected as study subjects by purposive nonprobability sampling method as per inclusion and exclusion criteria.

Inclusion Criteria

- Forcibly displaced Myanmar nationals (Rohingyas) admitted to Chittagong Medical College Hospital and their accompanying relatives.
- Patients who had given consent to participate in the study.

Exclusion Criteria

- Relatives of Rohingya patients who are not Rohingya.
- Patients who did not give consent to participate in the study.

All necessary investigations were done. Data were mostly collected from the patients through face-to-face interviews and some from the laboratory reports of investigation, and then placed into a preformed questionnaire. Data were processed and analyzed by using computer-based software SPSS- 20 (Statistical Package for Social Science) and Microsoft Office tools. A descriptive method was applied for data analysis. After analysis, the data were presented in tables and diagrams. Informed written consent was obtained from all study subjects. Ethical clearance was taken from the ethical committee of CMCH.

RESULTS

The majority of the patients (111, 55.5%) were in the 25-50 years of age group. The median age of the study subjects was 29.50 years (range 8-80 years) (Mean 33.1 ± 14.83 years). [Table 1]

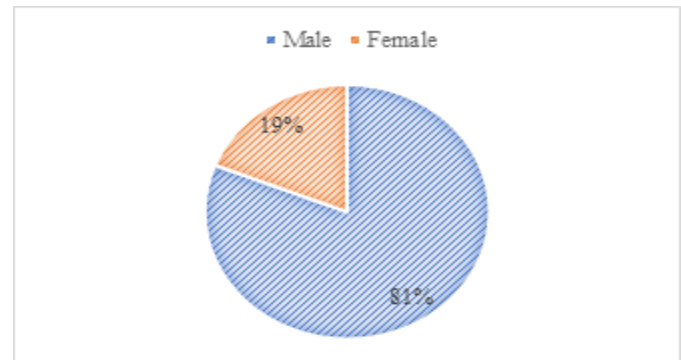


Figure 1: Gender distribution among the study subjects (N=200)

In this series, a majority (162, 81.0%) of the patients was male, and the rest (38, 9.0%) were female. Male to female ratio was 4.26:1. [Figure 1]

Concerning the socio-demographic and marital status, about 29% were single and 71% were married. Most of the respondent was farmers (50.5%), followed by day laborer (17.5%) and housewife (15%). [Table 2]

Regarding the presence of risk factors for getting HBV, and HCV infections the most prevalent factors were H/O circumcision (81%) and ear pricking (11.5%). Only 1.5% and 1% of patients had a history of unsafe sexual exposure and blood transfusion history respectively. [Table 3]

In this series, a history of unsafe sexual exposure had a statistically significant association with HBV seropositivity. Other risk

factors and sociodemographic characteristics were not found significant results. [Table 4]

It was observed that a history of blood transfusion had been found statistically significant association with HCV seropositivity. Other risk factors and sociodemographic characteristics were not found significant results. [Table 5]

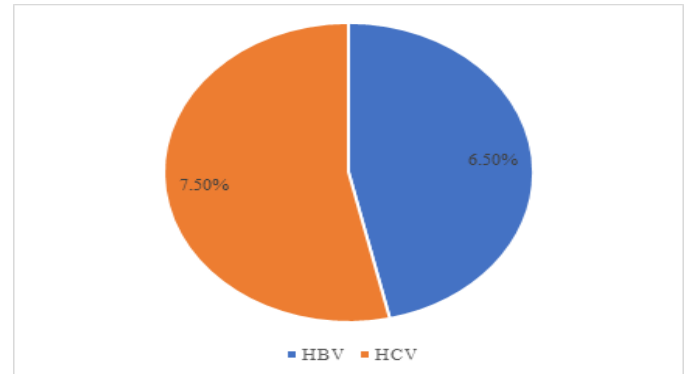


Figure 2: Frequency of seropositivity of HBV and HCV (N=200)

All of the 200 subjects were tested for HBV and HCV. Results showed that 13 patients (6.5%) and 15 patients (7.5%) were seropositive for HBV and HCV, respectively. [Figure 2]

Table 1: Age distribution of the respondents (N=200)

| Age (years) | n | % |
|-------------|-----|------|
| <25 years | 62 | 31.0 |
| 25-50 years | 111 | 55.5 |
| ≥50 years | 27 | 13.5 |

Table 2: Socio-demographic and marital status of the study population (N=200)

| Variables | n | % |
|----------------|------------|------|
| Marital status | Unmarried | 29.0 |
| | Married | 71.0 |
| Occupation | Unemployed | 11.0 |
| | Cultivator | 50.5 |
| | Housewife | 15.0 |
| | Labor | 17.5 |
| | Shopkeeper | 3.0 |
| | Retired | 3.0 |

Table 3: Prevalence of risk factors for infection among the study population (N=200)

| Risk factors | n | % |
|-------------------------|---|-----|
| Unsafe sexual exposure | 3 | 1.5 |
| Presence of tattoo mark | 0 | 0.0 |
| H/O IV drug abuse | 0 | 0.0 |



| | | |
|-------------------------------|-----|------|
| H/O surgery | 0 | 0.0 |
| H/O circumcision | 162 | 81.0 |
| H/O ear pricking | 23 | 11.5 |
| H/O blood transfusion | 2 | 1.0 |
| Family history of the disease | 2 | 1.0 |

Table 4: Association of sociodemographic and other variables with HBV seropositivity (N=200)

| Variables | | HBV seropositivity status | | | | P value |
|----------------------------|-------------|---------------------------|------|--------------|-------|---------|
| | | Seropositive | | Seronegative | | |
| Age group | <25 years | 3 | 4.8 | 59 | 95.1 | 0.191* |
| | 25-50 years | 10 | 9.0 | 101 | 91.0 | |
| | ≥25 years | 0 | 0.0 | 27 | 100.0 | |
| Gender | Male | 11 | 6.8 | 151 | 93.2 | 0.731* |
| | Female | 2 | 5.3 | 36 | 94.7 | |
| Marital status | Unmarried | 2 | 3.4 | 56 | 96.9 | 0.269* |
| | Married | 11 | 7.7 | 131 | 92.3 | |
| Occupation | Unemployed | 0 | 0.0 | 22 | 100.0 | 0.579* |
| | Farmer | 2 | 6.7 | 28 | 93.3 | |
| | Housewife | 4 | 11.4 | 31 | 88.6 | |
| | Labourer | 7 | 6.9 | 94 | 93.1 | |
| | Shopkeeper | 0 | 0.0 | 6 | 100.0 | |
| | Retired | 0 | 0.0 | 6 | 100.0 | |
| H/O unsafe sexual exposure | Yes | 2 | 66.7 | 1 | 33.3 | 0.011† |
| | No | 11 | 5.6 | 186 | 94.4 | |
| Circumcision | Yes | 11 | 6.8 | 151 | 93.2 | 0.731* |
| | No | 2 | 5.3 | 36 | 94.7 | |
| Ear prick | Yes | 2 | 8.7 | 21 | 91.3 | 0.65* |
| | No | 11 | 6.2 | 166 | 93.8 | |
| H/O blood transfusion | Yes | 0 | 0.0 | 2 | 100.0 | 1* |
| | No | 13 | 6.6 | 185 | 93.4 | |
| Family history | Yes | 1 | 50.0 | 1 | 50.0 | 1* |
| | No | 12 | 6.1 | 186 | 93.9 | |

*Not significant by Fischer Exact test; †Significant by Fisher Exact test

Table 5: Association of sociodemographic and other variables with HCV seropositivity (N=200)

| Variables | | HCV seropositivity status | | | | P value |
|-----------|-------------|---------------------------|------|--------------|------|---------|
| | | Seropositive | | Seronegative | | |
| | | n | % | n | % | |
| Age group | <25 years | 2 | 3.2 | 60 | 96.5 | 0.286* |
| | 25-50 years | 10 | 9.0 | 101 | 91.0 | |
| | ≥25 years | 3 | 11.0 | 24 | 84.9 | |



| | | | | | | |
|-----------------------|------------|----|-------|-----|-------|--------|
| Gender | Male | 11 | 6.8 | 151 | 93.2 | 0.492* |
| | Female | 4 | 10.5 | 34 | 89.5 | |
| Marital status | Unmarried | 1 | 1.7 | 57 | 98.3 | 0.072* |
| | Married | 14 | 9.9 | 128 | 90.1 | |
| Occupation | Unemployed | 0 | 0.0 | 22 | 100.0 | 0.419* |
| | Farmer | 4 | 13.3 | 26 | 86.7 | |
| | Housewife | 2 | 5.7 | 33 | 94.3 | |
| | Laborer | 8 | 7.9 | 93 | 92.1 | |
| | Shopkeeper | 1 | 16.7 | 5 | 93.3 | |
| | Retired | 0 | 0.0 | 6 | 100.0 | |
| H/O sexual exposure | Yes | 1 | 33.3 | 2 | 66.7 | 0.21* |
| | No | 14 | 7.1 | 183 | 92.7 | |
| Circumcision | Yes | 11 | 6.8 | 151 | 93.2 | 0.49* |
| | No | 4 | 10.5 | 34 | 89.5 | |
| Ear prick | Yes | 2 | 8.7 | 21 | 91.3 | 0.68* |
| | No | 13 | 7.3 | 164 | 92.7 | |
| H/O blood transfusion | Yes | 2 | 100.0 | 0 | 0.0 | 0.005† |
| | No | 13 | 6.6 | 185 | 93.4 | |
| Family history | Yes | 1 | 50.0 | 1 | 50.0 | 0.145* |
| | No | 14 | 7.1 | 184 | 92.9 | |

*Not significant by Fischer Exact test; †Significant by Fisher Exact test

DISCUSSION

Bangladesh has a low intermediate prevalence rate of HBV infection (4.0%), whereas, in Myanmar the prevalence is 6.5%.^[8,9] According to a study of Myanmar, of 642 PWID (People who inject drugs), 578 (90.0%) were tested for HIV, HBV and/or HCV. Overall, 404 (69.9%) were infected: 316 (78.2%) had one infection and the remainder had dual/triple infections.^[10] So, this study analyzed the frequency of HBV, and HCV seropositivity among the forcibly displaced Myanmar nationals (FDMN). In this series, a majority of the patients (111, 55.5%) were in 25-50 years of age group. The median age was 29.50 years (Mean 33.1±14.83years). Male to female ratio was 4.26:1. About 29% were single and 71% were married. Most of the respondents were cultivators (50.5%), followed

by day laborers (17.5%) and housewives (15%). In this study, 13 patients (6.5%) and 15 patients (7.5%) were seropositive for HBV and HCV, respectively. Regarding the presence of risk factors for getting HBV, and HCV the most prevalent factors were H/O circumcision (81%) and ear pricking (11.5%). Only 1.5% and 1% of patients had a history of unsafe sexual exposure and blood transfusion history respectively. No one had a tattoo mark on their body and no one had a history of surgery or intravenous (IV) drug abuse. Two respondents had a family history of chronic liver disease. According to the Liver Foundation of Bangladesh, about 4%-7% of the population has hepatitis B infection.^[11] A study conducted among patients who attended a tertiary care hospital in Dhaka City in 2014 showed HBsAg seroprevalence of 8%,^[12] but another report showed 5.5% HBsAg

seropositivity among the general population living in Savar, a semi-urban area in the outskirts of Dhaka in 2009 which was conducted by Mahtab et al.^[13] In a study conducted by Nakai K et al. in the city of Yangon, Myanmar, it was found that among 213 individuals without pre-existing health conditions, 16 patients (8%) tested positive for HBV infection, while 4 patients (2%) were found to be infected with HCV.^[14] This study showed the prevalence of Hepatitis B is 6.5% among Rohingya people which is comparable to the seroprevalence of Hepatitis B in Myanmar. As per an article published in the World Journal of Gastroenterology, 2016 the prevalence of Hepatitis C virus (HCV) infection is 2% in Myanmar, and HCV infection accounts for 25% of hepatocellular carcinoma. There is no population-based data on HCV prevalence in Bangladesh. Two separate studies showed a prevalence of HCV infection is 0.5% and 0.88%.^[15,16] In this study, Hepatitis C prevalence was found 7.5% which is a close match to the study conducted by the National Liver Foundation among Rohingya people.

Limitations of the Study: The study was conducted in a single hospital with a small sample size for a short duration. Therefore, it

couldn't reveal the overall picture of the Rohingya people. The study would have been more generalized if it had been conducted in refugee camps.

CONCLUSIONS

This study concludes that forcibly displaced Myanmar nationals (FDMN) have a high frequency of seropositivity for Hepatitis B and Hepatitis C infection. Among them, Hepatitis B virus is the most prevalent infection. It is high time to understand the epidemiology and to create strategies to improve public health which may help in disease prevention and control among this population.

Recommendation

Hepatitis B and Hepatitis C screening should be done for Rohingya people, at least when they come in close contact with the health care delivery system to reveal the actual scenario of Hepatitis B, Hepatitis C among them. The mass screening will help to prevent the spread of infections as well as help to vaccinate the non-infected individuals with the recommended vaccines for Hepatitis B. Moreover, further studies should be conducted involving a large sample size for a longer duration.

REFERENCES

1. Shohel MMC. Lives of the Rohingya children in limbo: Childhood, education, and children's rights in refugee camps in Bangladesh. *Prospects* (Paris). 2023;53(1-2):131-149. doi: 10.1007/s11125-022-09631-8.
2. Joarder T, Sutradhar I, Hasan MI, Bulbul MMI. A Record Review on the Health Status of Rohingya Refugees in Bangladesh. *Cureus*. 2020;12(8):e9753. doi: 10.7759/cureus.9753.
3. Habib MR, Chowdhury AR, Uldanov A. Creating Pathways to Opportunity: Non-formal Educational 'Inclusion' for Rohingya Refugee Children in Bangladesh. *J South Asian Dev*. 2023:09731741231202872.
4. Tay AK, Riley A, Islam R, Welton-Mitchell C, Duchesne B, Waters V, Varner A, Moussa B, Mahmudul Alam ANM, Elshazly MA, Silove D, Ventevogel P. The culture, mental health and psychosocial wellbeing of Rohingya refugees: a



- systematic review. *Epidemiol Psychiatr Sci.* 2019;28(5):489-494. doi: 10.1017/S2045796019000192.
5. Lim JK, Nguyen MH, Kim WR, Gish R, Perumalswami P, Jacobson IM. Prevalence of Chronic Hepatitis B Virus Infection in the United States. *Am J Gastroenterol.* 2020;115(9):1429-1438. doi: 10.14309/ajg.0000000000000651.
 6. Jazwa A, Coleman MS, Gazmararian J, Wingate LT, Maskery B, Mitchell T, et al. Cost-benefit comparison of two proposed overseas programs for reducing chronic Hepatitis B infection among refugees: is screening essential? *Vaccine.* 2015;33(11):1393-9. doi: 10.1016/j.vaccine.2015.01.010.
 7. Scott KC, Taylor EM, Mamo B, Herr ND, Cronkright PJ, Yun K, et al. Hepatitis B screening and prevalence among resettled refugees - United States, 2006-2011. *MMWR Morb Mortal Wkly Rep.* 2015;64(21):570-3.
 8. Banik S, Datta A, Ghosh A, Ghosh KY, Debi H. The prevalence of hepatitis B virus infection in Bangladesh: a systematic review and meta-analysis. *Epidemiol Infect.* 2022;150:e47. doi: 10.1017/S0950268822000061.
 9. Kyaw YY, Lwin AA, Aye KS, Thu HM, Htun MM, Soe HO, et al. Distribution of hepatitis B virus genotypes in the general population of Myanmar via nationwide study. *BMC Infect Dis.* 2020;20(1):552. doi: 10.1186/s12879-020-05269-z.
 10. Aye NS, Oo MM, Harries AD, Mon MM, Hone S, Oo HN, et al. HIV, HBV and HCV in people who inject drugs and are placed on methadone maintenance therapy, Yangon, Myanmar. *Public Health Action.* 2018;8(4):202-210. doi: 10.5588/pha.18.0050.
 11. Uddin KR, Akter S, Jinnah CMK, Talukder AA. Epidemiological study of active Hepatitis B and C viruses' infection among patients attended in tertiary care hospital in Dhaka City, Bangladesh. *J Appl Pharm Sci.* 2014;4(09):102-109
 12. Mahtab MA, Rahman S, Karim MF, Khan M, Foster G, Solaiman S, Afroz S. Epidemiology of hepatitis B virus in Bangladeshi general population. *J BSMMU.* 2009; 2(1): 14-17.
 13. Rabbi FJ, Alam MM, Rezwan K, Sultana R. Hepatitis B Virus Infection and Anti-HBc (Total) Positivity in CKD Patients before Dialysis. *J Enam Med Coll.* 2016;6(3):128-33.
 14. Nakai K, Win KM, Oo SS, Arakawa Y, Abe K. Molecular characteristic-based epidemiology of hepatitis B, C, and E viruses and GB virus C/hepatitis G virus in Myanmar. *J Clin Microbiol.* 2001;39(4):1536-9.
 15. Mahtab MA, Karim F, Foster G, Akbar SMF, Rahman S. Prevalence and Risk Factors of Asymptomatic Hepatitis C Virus Infection in Bangladesh. *J Clin Exp Hepatol.* 2011;1 (1):13-16.
 16. Shirin T, Ahmed T, Iqbal A, Islam M, Islam MN. Prevalence and risk factors of hepatitis B virus, hepatitis C virus, and human immunodeficiency virus infections among drug addicts in Bangladesh. *J Health Popul Nutr.* 2000;18:145-50.
- Source of Support: Nil, Conflict of Interest: None declared