

Risk Factors Associated with Transmission of Hepatitis B and Hepatitis C Virus in Pakistan

Umar Saeed¹

¹ Atta-ur-Rahman School of Applied Biosciences (ASAB), National University of Sciences and Technology (NUST), Islamabad (44000), Pakistan.

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Abstract

In Pakistan about 7 to 9 million people are living with HBV and 10 million people are living with HCV, with higher morbidity and mortality. This article reviews prevalence of Hepatitis B and Hepatitis C virus in Pakistan and risk factors associated with transmission of viral hepatitis. A literature search was conducted on research articles from Pubmed, PakMediNet and Google scholar. Prevalence of HBV and HCV infection varies in different regions due to inadequate knowledge and non implementation of international health standards. Majority of Pakistani population lives in rural areas as compared to urban areas. But unfortunately, up to date, no prevalence study has been reported from rural areas of Pakistan depicting HBV and HCV infection. Prevalence of HBV in general population, peds, pregnant women and IDUs was reported 4.5

Index terms— hepatitis B virus, hepatitis C virus, risk factors, awareness, needle stick injuries, barbers, blood transfusions.

1 Introduction

he HBV and HCV are blood borne pathogens, frequently causing deaths among general populations and various high risk populations. HBV and HCV were discovered in 1963 and 1975 respectively. HBV infected 2 billion people worldwide and about 400 million of them were chronically infected (Ali et al., 2011; Li, et al., 2010; Zhu, et al., 2008;. The HBV and HCV infection constitutes approximately 530 million of 6 billion world population (Hwang, et al., 2006; WHO, 2000; National Foundation for Infectious Diseases, 2012). WHO has declared South East Asia a high risk area for HCV with prevalence rate of 2.15% (WHO, 2000). Liver cirrhosis develops in 20% of HCV infected patients after 10-20 years, while liver cancer usually appears after 20-40 years post infection (Denson, 2005). In Pakistan, 7 to 9 million people are living with HBV with an approximate carrier rate of 3 to 5% (Ali, et al., 2011). While about 10 million people are living with HCV in Pakistan. Asymptomatic spread of chronic infection is major dilemma, which significantly contributes toward dissemination of lethal viral infection to others in society (Farooqi, et al., 2007). Horizontal transmission in early childhood is major contributing factor for chronic viral hepatitis infection in Pakistan (Mujeeb, et al., 1997). The perinatal transmission is leading cause of high rate of chronic infection in developing countries of Asia and Africa, whereas parenteral transmission is frequent cause of cases reported from developed industrialized countries (Maddrey, et al., 2000). Among injection drug, paid blood donors and multitransfused thalassemia populations, there is an increased transmission risk of transfusion transmitted HBV and HCV infections. In developing countries, increased transmission of HBV and HCV is due to non implementation of international standards on blood transfusions, perinatal transmission, intranasal cocaine use, shared shaving equipments, intravenous drug users, tattoos, sexual activity, needle stick injuries, body piercing, hemodialysis, hemophilia and transplants.

2 II.

3 Literature Search

A literature search was performed via accessing research articles of previous two decade from PakMediNet, Pubmed and Google Scholar with key words of Hepatitis B virus and Hepatitis C virus associated risk factors, barbers, needle stick injuries, blood transfusion. The valued information was subjected for review.

4 III.

5 Hepatitis B Virus in Pakistan

There exists a limited knowledge in general population about epidemiological patterns of hepatitis B prevalence in different communities of Pakistan. Noorali et al. reported prevalence of HBV in general population of Karachi to be of 4.5% (Noorali, et al., 2008). According to Chaudhary et al. the prevalence of HBV in individuals from Rawalpindi was approximately 2.3% (Chaudhary, et al., 2007). It has been reported that the prevalence of HBV in peds was 1.8% (Jafri, et al., 2006). In a study conducted on recruitment individuals from different areas of Pakistan, the prevalence of HBV was reported to be of 3.2% (Mirza, et al., 2006). Several seroprevalence studies have been conducted on blood transfusion populations. Prevalence of HBV in pregnant women is significantly different in different regions of Pakistan, depending upon availability or absence of hygienic environment. According to various studies conducted on pregnant women, it has been reported that HBV prevalence range between 0.34% (minimum reported rate) to 12.62% (maximum reported rate) (Sheikh, et al., 2009; Yousfani, et al., 2006). Sometimes health care workers are accidentally exposed to blood borne pathogens due to various reasons such as needle prick injuries and contact to patients body fluids. It has been reported that the prevalence of HBV among health care workers from Abbottabad was 2.4% (Sarwar, et al., 2008). Similar kind of study was reported from Karachi, with HBV prevalence of 2.4% (Aziz, et al., 2006). Injection drug users and multitransfused population can be considered as populations at risk for bloodborne pathogenic infection.

Unscreened blood supply could be a major threat for transfusion transmitted infections. According to study conducted from Karachi on IDUs, it has been reported that HBV prevalence was 22.4%. Although there exist an increased threat of viral infection among multitransfused population, yet due to limited resources and awareness; only few studies have been reported from Pakistan. Majority of Pakistani population lives in rural areas as compared to urban areas. But unfortunately, up to date, no study has been reported from rural areas of Pakistan. According to HBV screening studies conducted in Islamabad, Lahore and Peshawar the prevalence of HBV was reported as 12.4%, 4% and 5% respectively (Hussain, et al., 2003; Khokhar, et al., 2004). In order to prevent future epidemic of HBV in Pakistan, many efforts are required from both government and public sector authorities. In Pakistan, various vaccination campaigns are being conducted with major emphasis on prevention of HBV infection in neonates. It has been reported by UNICEF-WHO that approximately 73% of Pakistani neonates were vaccinated against hepatitis B virus (WHO/UNICEF, 2008). Frequent vaccination programs should be conducted at national level for people from all age groups in order to decrease the future burden of disease.

6 IV.

7 Hepatitis C Virus in Pakistan

In 2008 Hakim et al. conducted a study on prevalence of HCV in Karachi with population size of 3820. According to the study the prevalence of HCV was 5.20 among general population (Hakim et al., 2008). It has been reported by Aziz et al. that prevalence of HCV is 1.40% in pediatric population of Karachi, which depicts increased threat of early chronic infection in such individuals (Aziz et al., 2007). In recruitment individuals from Sargodha, HCV prevalence was reported to be 4.41% (Alam et al., 2006). In Hyderabad, Yousfani et al. reported prevalence of HCV to be 16.50%; which describes HCV to be an increasingly health problem in pregnant women (Yousfani et al., 2006). Multitransfused populations are at increased risk of developing viral hepatitis due to limited screening facilities, prior to blood transfusion, at various blood transfusion setups of rural areas and towns. In majority of urban areas absence of healthy blood transfusion facilities and scarcity of quality assurance procedure drag the poor patients towards more serious consequences in term of lethal viral infections. Hepatitis treatment is very expensive and it creates huge burden on Pakistan economy. Government should raise awareness among the nation by frequent use of electronic media and by modifying syllabus of schools and colleges.

V.

8 Risk Factors Associated with Transmission of HBV and HCV

a) Reuse of needles and needle stick injuries

There exist an increased evidence of hepatitis B and hepatitis C virus transmission due to frequent reuse of needles and syringes. It has been reported that there are many group of individuals who are actively involved in repacking and recycling of used needles and syringes. These products are later on supplied at many drug stores.

It was further reported that because of refine packaging it becomes very difficult for general public to distinguish between new disposable sterilized needles and repacked unsterilized syringes (Simonsen, et al., 1999; Abdul Mujeeb, et al., 2003). It has been reported that during 2002 to 2007, 1382 needle stick injuries occurred at Aga Khan University hospital Pakistan with higher incidence associated with young doctors (28.5%), nurses (20.4%). It has been further reported that approximately 19% of overall injuries occurred during blood collection (WHO unsafe inj, 2000). In order to doctors. According to Janjua et al approximately 68% of individuals received injection in previous 3 months and out of those injections only 54% were provided from new syringes (Janjua, et al., 2005). It has been reported that estimated number of injections varies from 8.2 to 13.6 per person per year, which are highest as compared to other developing countries. Among these almost 94.2% were further categorized as unnecessary (Altaf, et al., 2007). It has been reported by Khan et al that 44% of Pakistani population would prefer injections (as compared to oral medicine) as therapeutic options against various ailments (Khan, et al., 2000). Due to poor sanitary conditions in various health sectors, it has been reported that almost 60% of used syringes are not properly destroyed, instead are majorly dumped into general public waste. Persons who are involved in garbage collection are more prone to acquire viral infections due to needle stick injuries (Abdul Mujeeb, et al., 2003; Waheed, et al., 2009).

9 b) Barbers

In Pakistan, most of HBV and HCV infected individuals have history of shaving from barbers. In 2010, a survey was conducted on 508 barber shops from capital twin cities of Pakistan. It was reported that 99.8% of barbers were washing razor with water. It was further reported that only 39.6% knew about HBV and HCV as bloodborne viral pathogens. There exist moderate awareness about different transmission routes of hepatitis and majority of them were unaware of vaccination. Most of barbers are involved in disposing of used blades in general public waste, hence posing higher risk for scavengers and sweepers during garbage handling. Injuries caused by infected blades, could bring havoc in lives of healthy individuals. It has been reported that approximately 80% of barbers applied potash alum stone (also known as Phatkari) on facial cuts in order to prevent bleeding. Using single stone on multiple customers could be a threat for transmission of viral hepatitis B virus, hepatitis C virus and human immunodeficiency virus. Some barbers have high burden of work especially at weekends and holidays. On special occasions (such as Eid days and festivals), the potash alum stone is consumed in just couple of days. It is the property of hepatitis B virus that it can easily survive for more than seven days on solid surfaces and instruments (Downey, 2008). In Muslim community, circumcision is universal. This procedure is mostly performed by barbers in rural and urban areas. Due to lack of awareness and knowledge about transmission of viral hepatitis, most of barbers, during circumcision, use contaminated instruments on multiple clients. This unhealthy practice makes infants prone to bloodborne viral pathogens.

10 c) Blood Transfusions

In Pakistan, most of the individuals have requirement of healthy blood donation for life saving purpose. Under such circumstances, unscreened pathogen carrying blood could be a potential source of transfusion transmitted infections and future complications. It has been stated by WHO that annual blood transfusions carried out in Pakistan are approximately 1.2-1.5 million (WHO country office in Pakistan, Blood safety, 2009). It has been reported that during blood transfusions carried out in Karachi, only 25% donations were obtained from volunteer donors and 23% of those donations were screened for hepatitis C virus (Luby, et al., 2000). Almost sixty six percent of Pakistani population belongs to rural areas. In these sectors, the blood transfusion facilities are not satisfactory due to absence of organized infrastructure and electricity problem. Replacement donors including friends, family members and relatives are among the major source for blood donations. In order to strengthen the good relations, most of donors hide their health status and thus become willing to support their lives. Identification of most appropriate donors and ensuring proper blood screening prior to donations are the key factors associated with safe blood donation. For safe blood donation, the donors must possess repeated negative results for bloodborne pathogens. Blood requirements are on its peak during pregnancy related issues, traumatic injuries, thalassemia, dialysis, hemophilia. In order to cope with such emergency situations; organized, fair and safe blood transfusion setups must be developed at national level with easy accessibility. There is an urgent demand for implementation of international blood safety standards at various blood transfusion setups to ensure limited risk for transmission of hepatitis B and hepatitis C virus.

11 d) Conclusion

The prevalence of Hepatitis B virus Hepatitis C viruses is rapidly increasing in different regions of Pakistan due to non implementation of international health standards and limited awareness of HBV and HCV prevention among general and high risk populations. Although public health authorities are raising awareness among general and high risk population by the assistance of electronic and print media, yet unfortunately these efforts are not practiced at majority of Pakistani rural areas. In order to decrease future burden of disease preventive measures

Figure 1:

154 should be adopted, these includes; proper sterilization of health care instruments, use of disposable syringes and
155 new razor blades and screening of blood against transfusion transmitted infectious agents.¹

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[Pakistan] , Pakistan . http://www.childinfo.org/files/fiji_1980_2008.pdf

[Aziz et al. ()] , S Aziz , R Muzaffar , S Hafiz , Z Abbas , M Zafar , N Naqvi , S , A Rizvi , S , A . 2007.

[Li et al. ()] 'A novel real-time PCR assay for determination of viral loads in person infected with hepatitis B virus'. G Li , W Li , F Guo , S Xuc , N Zhaod , S Chena , L Liu . *J Virol Meth* 2010. 165 p. .

[Yousfani et al. ()] 'Antenatal screening for hepatitis B and C virus carrier state at a university hospital'. S Yousfani , F Mumtaz , A Memon , M Memon , A Sikandar , R . *J Lia Uni Med Health Sci* 2006. 5 p. .

[Waheed et al. ()] 'Awareness and risk factors associated with barbers in transmission of hepatitis B and C from Pakistani population: barber's role in viral transmission'. Y Waheed , U Saeed , S Safi , Z Chaudhry , W , N Qadri , I . *Asian Biomed* 2010. 4 (3) p. .

[Downey ()] *Can Salons Spread Infection?*, C Downey . <http://www.thirdage.com/skin-hair-nails/can-salons-spread-infection-0> 2008.

[Smith ()] *Chronic Hepatitis C: Current disease management*, Denson Smith . 2005.

[Alam et al. ()] *Common genotypes of hepatitis B virus prevalent in injecting drug abusers(addicts) of North West Frontier Province of Pakistan*, M M Alam , S Z Zaidi , S Shaukat , S Sharif , M Angez , A Naeem , S Saleha , J A Butt , S A Malik . 2007. *Vir J*, 4. p. 63.

[Alam et al. ()] *Common genotypes of hepatitis B virus prevalent in injecting drug abusers(addicts) of North West Frontier Province of Pakistan*, M M Alam , S Z Zaidi , S Shaukat , S Sharif , M Angez , A Naeem , S Saleha , J A Butt , S A Malik . 2007. *Vir J*, 4. p. 63.

[Waheed et al. ()] 'Epidemiological patterns and risk factors associated with hepatitis B virus in Pakistani population'. Y Waheed , T Rahat , B Safi , S , Z Qadri , I . *Asian Biomedicine* 2010. 4 (4) p. 547.

[Luby et al. ()] 'Evaluation of blood bank practices in Karachi, Pakistan, and the government's response'. S Luby , R Khanani , M Zia , Z Vellani , M Ali , A Qureshi , H Khan , A , J Abdul Mujeeb , S Shah , S , A Fisher-Hoch , S . *Health Pol Plan* 2000. 15 p. .

[Mujeeb et al. ()] 'Evaluation of blood bank practices in Karachi, Pakistan, and the government's response'. S Mujeeb , S Shah , A Fisher-Hoch , S . *Health Pol Plan* 2000. 15 p. .

[Hussain et al. ()] 'Frequency of hepatitis B and C in hemophiliac children'. M Hussain , M Khan , A Jan , M , Jan , A . *Pak Pead J* 2003. 27 p. .

[Farooqi et al. ()] 'Frequency of hepatitis B and C in selected groups of population in NWFP Pakistan'. J Farooqi , I Farooqi , R , J Khan , N , Mussarat . *JPMI* 2007. 21 (03) p. .

[Helicobacter pylori, hepatitis viruses A, C, E, antibodies and HBsAg -prevalence and associated risk factors in pediatric communities of Karachi]. 'Helicobacter pylori, hepatitis viruses A, C, E, antibodies and HBsAg -prevalence and associated risk factors in pediatric communities of Karachi'. *J Coll Physicians Surg Pak* 17 p. .

[Jafri et al. ()] 'Hepatitis B and C: prevalence and risk factors associated with seropositivity among children in Karachi'. W Jafri , N Jafri , J Yakoob , M Islam , S Tirmizi , F , A Jafar , T . *BMC Infect Dis* 2006. 6 p. 101.

[Sheikh ()] 'Hepatitis B and C: value of universal antenatal screening'. S Sheikh , M . *J Coll Physicians Surg Pak* 2009. 19 p. .

[Ali et al. ()] 'Hepatitis B virus in Pakistan: A systematic review of prevalence, risk factors, awareness status and genotypes'. M Ali , M Idrees , L Ali , A Hussain , I Rehman , S Saleem , S Afzal , S Butt . *Virology Journal* 2011. 8 p. 102.

[Zhu et al. ()] 'Hepatitis B virus mutations associated with in situ expression of hepatitis B core antigen, viral load and prognosis in chronic hepatitis B patients'. R Zhu , H Zhang , H Yu , H Li , Y Ling , Q Hu , X , Q Zhu , H , G . *Pathol Res Pract* 2008. 204 p. .

[Maddrey ()] 'Hepatitis B: an important public health issue'. W Maddrey , C . *J Med Virol* 2000. 61 p. .

[Waheed et al. ()] 'Hepatitis C virus in Pakistan: A systematic review of prevalence, genotypes and risk factors'. Y Waheed , T Shafi , S Safi , Z Qadri , I . *World J Gastroenterol* 2009. 15 (45) p. .

[Khokhar and Naz ()] 'Hepatitis B surface antigenemia in patients on hemodialysis'. N Khokhar , F Naz . *Rawal Med J* 2004. 29 p. .

[Kuo et al. ()] 'High HCV seroprevalence and HIV drug use risk behaviors among injection drug users in Pakistan'. I Kuo , S Ul-Hasan , N Galai , D Thomas , L Zafar , T Ahmed , M , A Strathdee , S , A . *Harm Reduct J* 2006. 3 p. 26.

[Altaf et al. ()] 'High prevalence of HIV infection among injection drug users (IDUs) in Hyderabad and Sukkur, Pakistan'. A Altaf , N Saleem , S Abbas , R Muzaffar . *J Pak Med Assoc* 2009. 59 p. .

[Alam and Tariq ()] 'Knowledge, attitudes and practices about hepatitis B and C among young healthy males'. M Alam , W Tariq , Z . *Pak J Pathol* 2006. 17 p. .

[Malik and Hussain ()] 'Marker of viral hepatitis in hemophiliacs'. N Malik , Z Hussain . *Biomedica* 2006. 22 p. .

11 D) CONCLUSION

- 211 [Malik and Hussain ()] 'Marker of viral hepatitis in hemophiliacs'. N Malik , Z Hussain . *Biomedica* 2006. 22 p. .
- 212 [National Foundation for Infectious Diseases, Hepatitis B for Adults, Fact sheet ()] *National Foundation for In-*
- 213 *fectious Diseases, Hepatitis B for Adults, Fact sheet*, 2012. 28.
- 214 [Shah et al. ()] 'Prevalence of hepatitis B and hepatitis C virus infection in multitransfused thalassaemia major
- 215 patients in North West Frontier Province'. S Shah , M , A Khan , M , T Zahour-Ullah , N Ashfaq , Y . *Pak*
- 216 *J Med Sci* 2005. 21 p. .
- 217 [Noorali et al. ()] 'Prevalence of hepatitis B virus genotype D in females in Karachi Pakistan'. S Noorali , S
- 218 Hakim , T Mclean , D Kazmi , S , U Bagasra , O . *J Infect Devel Count* 2008. 2 (1) p. . (Pathol)
- 219 [Aziz et al. ()] 'Prevalence of HIV, hepatitis B and C amongst health workers of Civil Hospital Karachi'. S Aziz
- 220 , A Memon , H Tily , I Rasheed , K Jehangir , K Quraishy , M , S . *J Pak Med Assoc* 2002. 52 p. .
- 221 [Aziz et al. ()] 'Prevalence of HIV, hepatitis B and C amongst health workers of civil hospital Karachi'. S Aziz ,
- 222 A Memon , H Tily , I Rasheed , K Jehangir , K Quraishy , M , S . *J Pak Med Assoc* 2006. 56 p. .
- 223 [Mujeeb et al. ()] 'Recycling of injection equipment in Pakistan'. Abdul Mujeeb , S Adil , M , M Altaf , A Hutin
- 224 , Y Luby , S . *Infect Control Hosp Epidemiol* 2003. 24 p. .
- 225 [Hwang et al. ()] 'Relationship of cosmetic procedures and drug use to hepatitis C and hepatitis B virus infections
- 226 in a low-risk population'. L Hwang , Y Krammer , J , R Troisi , C Bull , L Grimes , C , Z Lyerla , R Alter ,
- 227 M , J . *Hepatology* 2006. 44 (2) p. .
- 228 [Review of National Immunization ()] *Review of National Immunization*, 2009. Coverage1980-2008.
- 229 [Mirza et al. ()] 'Sero prevalence of Hepatitis B and C in young Adults seeking recruitment in armed forces'. I
- 230 Mirza , A Mirza , S , H Irfan , S Siddiqi , R Tariq , W , Z , Asif . *Pak Armed Forces Med J* 2006. 56 p. .
- 231 [Hakim et al. ()] 'Seroprevalence of Hepatitis B and C Genotypes Among Young Apparently Healthy Females of
- 232 Karachi Pakistan'. S Hakim , T Kazmi , S , U Bagasra , O . *Libyan J Med* 2008. 3 p. .
- 233 [Sarwar et al. ()] 'Seroprevalence of hepatitis B and hepatitis C in health care workers in Abbottabad'. J Sarwar
- 234 , N Gul , M Idris , A Rehman , J Farid , Adell , M , Y . *J Ayub Med Coll Abbottabad* 2008. 20 p. .
- 235 [Chaudhary et al. ()] 'Seroprevalence of hepatitis-B and C among patients reporting in surgical OPD at Fauji
- 236 Foundation Hospital, Rawlapindi Review of 5 year literature'. I Chaudhary , A Shah , S , K Majrooh , M ,
- 237 A Alvi , A , A . *Pak J Med Sci* 2007. 23 p. .
- 238 [Khan et al. ()] 'Unsafe injections and the transmission of hepatitis B and C in a periurban community in
- 239 Pakistan'. A Khan , J Luby , S , P Fikree , F Karim , A Obaid , S Dellawala , S Mirza , S Malik , T
- 240 Fisher-Hoch , S McCormick , J , B . *Bull W H Org* 2000. 78 p. .
- 241 [Simonsen et al. ()] 'Unsafe injections in the developing world and transmission of bloodborne pathogens: a
- 242 review'. L Simonsen , A Kane , J Lloyd , M Zaffran , Kane , M . *Bull W H Org* 1999. 77 p. .
- 243 [World Health Organization, Hepatitis C Fact sheet No ()] *World Health Organization, Hepatitis C Fact sheet*
- 244 *No*, <http://www.who.int/mediacentre/factsheets/fs164/en/> 2000.
- 245 [World Health Organization.WHO country office in Pakistan Blood Safety ()] 'World Health Organiza-
- 246 tion.WHO country office in Pakistan'. [http://www.emro.who.int/pakistan/programmeareas_](http://www.emro.who.int/pakistan/programmeareas_bloodsafety.htm)
- 247 [bloodsafety.htm](http://www.emro.who.int/pakistan/programmeareas_bloodsafety.htm) *Blood Safety* 2009.