HEPATITIS-C VIRUS INFECTION AMONG BARBERS AND BEAUTICIANS IN LAHORE, AN ANALYTICAL CROSS SECTIONAL STUDY

Abdul Majeed Akhtar[1], Sadia Majeed[2]

[1]Punjab Provincial TB Control Program, Directorate of General health Services Punjab, Lahore

[2]College of Home Economics, Gulberg, Lahore

ABSTRACT: *The aim of this study was to determine the prevalence and risk factors of hepatitis C virus among barbers and beauticians infected with the disease, furthermore different genotypes of HCV infection were also detected and subsequently most prevalent subtype was predicted.*

All samples were processed for Anti-HCV antibody detection through ELISA by using third generation ELISA Kit. The Anti-HCV positive serum samples were stored for RT-PCR to estimate the genotypes of HCV for study. Barbers and beauticians selected from in and around Lahore Metropolitan from June 2013 to December 2013 were included. The data analysis was done by using SPSS version 16. A P-value of < 0.05 was considered to be significant.

A total of 129 barbers and beauticians were enrolled and screened for Anti HCV in the study. The mean age of reactive and non reactive barbers and beauticians was 40.33±16.56 and 28.70±8.01 years, respectively. Gender, Qualification, Income per month, working shift, tattoo on the body, injecting drug user and razor Sharing were significantly associated with HCV status i.e. P-value<0.05. Out of 9 reactive respondents, 6 patients' viral genotype was Type-3 and 3 patients were having multiple viral genotypes. The most prevalent subtype of HCV genotype was 3a (n=4) followed by 3b (n=2). In our study high prevalence of HCV infection was observed among the male barbers and beauticians while working hours and sharing of razor were sources of infection of HCV.

Key Words: Barbers, Beauticians, HCV infection, Genotype

INTRODUCTION:

The prevalence of antibodies against HCV was higher among the barbers (2.8%) as compared to the comparison group (1.1%) [1,2] and 5.9% among beauticians [3]. The practice of reuse of razor was very common among the barbers.11.4% cleaned the razors with antiseptic solution and 46% reused the razors [4]. HCV seroprevalence was observed 9% among 700 patients in which 74.7% were males and 25.3% were females [5]. It was found that beauty therapists involved in many practices which exposed them to blood and 62% were unaware of factors responsible for the spread of hepatitis C, 42% considered sharing utensils and 28% thought sneezing responsible for the spread of hepatitis C [6.7].

Almost 58% barbers having the mean age 33.3% did not know about the risks associated with their profession. While barbers in the mean age group 15 to 25 had better knowledge about the health hazards associated with their profession. It was concluded that majority of the barbers did not have knowledge about the unhealthy practices and receiving infection from their clients [8]. The main factors responsible for the transmission of HCV were unscreened blood transfusion, contaminated barber tools, contaminated dentist equipments, contaminated surgery equipment and infected syringes [9]. In different areas of Pakistan it was found that majority of males having age 20 years or older generally went to barber shop for their shaves. Using non sterile blades were the additional factor for being the males more seropositive as compared to females. It was further elaborated that piercing of nose and ear with unsterilized needles, which was a common practice in most of the areas of Pakistan, were the additional factors responsible for the spread of HCV in females [10. 11].

In Egypt on 308 barbers and their 308 clients were studied to determine the prevalence of hepatitis B and C, as well as to assess their knowledge, attitude and practices. It was observed that 12.3% barbers and 12.7% clients of barbers were infected with hepatitis C [12]. Less than 1% of barbers were aware of HBV or HCV as causative agents of liver disease or jaundice [13]. The prevalence of active HCV infection among high risk groups was 15.57% (26/167), and the prevalence of HCV in individual risk groups were 8%, 14.28%, 14.28%, 15% and 28.8% in the case of major surgery, dental treatment, injection drug users and thalassemias respectively. Higher prevalence of HCV in males was probably due to exposure to numerous risk factors. According to their cultural environment, females were only negligibly exposed to some of the risk factors e.g. tattooing, injecting drug use, barbers etc. Higher prevalence in males associated with cultural attributes [14].

Anti- HCV antibody was repeatedly detected in 2(1.0%) patients with age groups 18-39 years (0.7%). Anti-HCV antibody was only detected 2(1.2%) among male[15]. The present study was conducted to predict the prevalence of Hepatitis C Virus infection among barbers and beauticians diagnosed with anti HCV antibody in and around Lahore Metropolitan. The authors also discussed the various demographic and risk factors associated with HCV infection. The different genotypes of HCV were also detected in this study and prevalent subtype was estimated.

MATERIALS AND METHODS

The present study was carried out to estimate the prevalence of laboratory confirmed Hepatitis-C virus infection in barbers and beauticians among the population of Lahore metropolitan. The risk factors of Hepatitis-C virus infection and distribution of genotypes of Hepatitis-C virus among barbers and beauticians through RT-PCR was assessed. Data collection was done through a pretested questionnaire (to study the risk factors associated with HCV infection) and blood samples. The convenient sampling technique was used in barbers and beauticians as it was difficult to access all the members of the groups and many of them refuse to participate in the study. The process of data collection was completed during the period of six months (June 2013 to December 2013). All samples were processed at Mayo hospital for Anti-HCV antibody detection through ELISA and third generation

ELISA Kit (ETI-AB-HCVK-4, Diasorin S.P.A Italy) containing 96 wells was used for Enzyme Linked Immunosorbent Assay.

To study the different genotypes of Hepatitis-C virus, the Anti-HCV positive serum samples were stored and processed for RT-PCR (Real-time PCR Cepheid smart cycle was applied by using the QIAamp Mini column kit and the Sacace HCV Genotyping kit). The data collection was done through non-probability convenience sampling technique and was analyzed statistically by using SPSS version 16. All the quantitative data were presented in the form of frequency, percentage and mean ± S.D. The qualitative data were presented in the form of proportion and percentage where appropriate. T-test was used to access the difference of means between reactive and non-reactive barbers and beauticians. The chi - square test was used to analyze the qualitative data. A P-value < 0.05 was considered to be significant. Odds Ratio with 95% Confidence interval was used to see the magnitude of dependency on various risk factors.

RESULTS

In this group 129 barbers and beauticians were enrolled and tested for Anti HCV. Mean age among reactive and non reactive barbers and beauticians was 40.33±16.56 and 28.70±8.01 years. According to p-value significant difference was present in the age of reactive and non reactive barbers and beauticians. i.e. (p-value<0.05) (Table-1)

In this group 129 barbers and beauticians were selected and tested for Anit-HCV. Among these selected barbers and beauticians 9 (6.97%) were reactive for Anti-HCV. Marital status, Visit to abroad, working hours, length of service, history of surgery, from where got surgical treatment, blood transfusion, dental procedure, received injections during treatment, use of drugs prescribed by, type of drugs used, Pricked by sharps, history of road accident, use of alcohol, disease history of relative, if yes then type of relationship, sexual activity after joining the saloon other than wife was insignificantly associated with Anti-HCV status (P>0.05). Gender , Qualification, Income per month, working shift, tattoo on the body, injecting drug user, have you ever got tested yourself for HCV/HbsAg were significant risk factors of Anti-HCV (P<0.05). **(Table-2 & 3).**

Table-1: Distribution of reactive (Positive) & non-reactive (Negative) Beautician and Barbers

	HCV		Total
	Reactive (Positive)	Non-Reactive (Negative)	
Number (%)	**9 (6.97%)**	**120 (93.03%)**	**129**
Mean Age (years)	40.33	28.70	**29.51**
Std. Deviation	16.56	8.01	**9.03**
(Independent sample t-test) p-value=0.030 Statistically significant at 5% α level			

No significant association was present for utensils, sharing with respect to Anti-HCV status (Reactive/Non-Reactive) i.e. [Comb Sharing (P>0.05, OR=1.085), Glass Sharing (P>0.05, OR=0.863), Spoon Sharing (P>0.05, OR=0.863), Towel Sharing (P>0.05, OR=0.567), Straw Sharing (P>0.05, OR=3.762), Nail Cutter (P>0.05, OR=0.581), Tooth Brush (P>0.05, OR=3.762)] while Razor Sharing (P<0.05, OR=2.708) was statistically significant (Table-4).

Table 5 summarizes the distribution of HCV genotypes with subtypes in barbers and beauticians at higher risk among the positive cases of HCV infection. Among 9 patients reactive for Anti-HCV, 6 patients' viral genotype was Type-3 and 3 patients were having multiple viral genotypes. The most prevalent subtype of HCV genotype was 3a (n=4) followed by 3b (n=2).

Table-2: Distribution of Hepatitis C Virus reactive & Non-reactive Beautician and Barbers according to Demographic characteristics

Demographic Characteristics		Anti Hepatitis C Virus		p-value	ODDS Ratio	Confidence Interval
		Reactive	Non-Reactive			
Gender	Male	6	84	0.003	0.857	0.071-10.379
	Female	3	36			
Geographical Status	Punjabi	9	120	-	-	-
Marital Status	Married	6	72	0.82	1.333	0.111-15.96
	Unmarried	3	48			
Educational status	Illiterate	9	105	0.017	0.286	0.021-3.758
	Educated	3	15			
Socioeconomic status	5000-10000	6	48	0.004	-	-
	11000-30000	3	66			
	31000-40000	0	6			

Table-3:Summary of association between Hepatitis C and various indicators about Beautician and Barbers

Indicators	Response	Anti Hepatitis C Virus		p-value	ODDS Ratio	Confidence Interval	
		Reactive	Non Reactive			Lower	Upper
Have you ever visited abroad	Yes	0	18	0.859	0.7582	0.034-16.49	
	No	9	102				
Working Hours	6-Hours	6	27	0.091	6.889	0.558-84.984	
	12-Hours	3	93				
What is you working shift	Morning	3	102	0.001	-	-	
	Evening	3	18				
	Night	3	0				
What is your length of service in profession	1-10 Years	9	90	0.613	-	-	
	11-20 Years	0	15				
	21-30 Years	0	15				
Have you undergone any surgery	Major	3	9	0.240	-	-	
	Minor	3	24				
	None	3	87				
From where you got surgical treatment	Private Sector	3	12	0.279	-	-	
	Public Sector	3	18				
	Not Applicable	3	90				
Blood transfusion	Yes	0	12	0.926	1.159	0.05113, 26.26	
	No	9	108				
Dental procedure	Yes	6	57	0.021	2.211	0.1853, 26.38	
	No	3	63				
Have you any tattoo on the body	Yes	3	3	0.014	19.500	0.866-439.32	
	No	6	117				
Received injections during treatment	Yes	6	63	0.635	1.810	0.152-21.594	
	No	3	57				
Do you use drugs prescribed by	Doctor	9	117	0.412	0.2658	0.0090-7.822	
	Quacks	0	3				
If yes what type of drugs	Oral	0	51	0.313	-	-	
	Injectable	0	3				
	Both	9	66				
Are you inject drugs user	Yes	3	3	0.014	19.500	0.866-439.32	
	No	6	117				
Pricked by sharp	Occasionally	9	120	-	-	-	
Have you got any road accident	Yes	3	45	0.885	0.833	0.069-9.994	
	No	6	75				
Have you ever got tested yourself for	Hepatitis C	3	3	0.014	19.500	0.866-439.32	
	No	6	117				
Do you have any relative having	Hepatitis	3	15	0.467	-	-	
	No Disease	6	105				
If yes what kind of relationship	Household	3	15	0.317	3.5	0.266-46.04	
	Not applicable	6	105				
Ever been sent to look up or jail	No	9	120	-	-	-	
Involved in sexual activity after joining saloon other than wife	Yes	3	15	0.315	3.500	0.266-46.045	
	No	6	105				

Table-4: The effect of sharing utensils and other items by Beautician and Barbers.

Sn			Anti-HCV		p-value	ODDS Ratio	Confidence Interval
			Reactive	Non Reactive			
1	**Comb Sharing**	**Yes**	9	105	0.959	1.085	0.049-23.98
		No	0	15			
Note: Odds Ratio was calculated by adding 0.5 in each Cell							
2	**Glass Sharing**	**Yes**	9	108	0.962	0.863	0.038-19.56
		No	0	12			
Note: Odds Ratio was calculated by adding 0.5 in each Cell							
3	**Spoon**	**Yes**	9	108	0.962	0.863	0.038-19.56
		No	0	12			
Note: Odds Ratio was calculated by adding 0.5 in each Cell							
4	**Towel Sharing**	**Yes**	9	99	0.772	0.567	0.072-33.66
		No	0	21			
Note: Odds Ratio was calculated by adding 0.5 in each Cell							
5	**Straw Sharing**	**Yes**	0	3	0.412	3.762	0.127-110.7
		No	9	117			
Note: Odds Ratio was calculated by adding 0.5 in each Cell							
6	**Razor Sharing**	**Yes**	5	36	0.024	2.708	0.686-10.69
		No	4	78			
7	**Nail Cutter**	**Yes**	6	93	0.668	0.581	0.047-7.163
		No	3	27			
8	**Tooth Brush**	**Yes**	0	3	0.412	3.762	0.1278- 110.7
		No	9	117			

Table-5: Distribution of HCV Genotypes (Subtypes) in barbers and beauticians

	Types of HCV Genotypes						
Groups	**Type -1**	**Type -2**	**Type-3**	**MG ***	**ND** **	**UT*** **	**Total**
Barbers & Beautician	0	0	6(3a,3b)	3	0	0	**9**

MG*= Multiple Genotypes, **ND****= Not detected, **UT***=** Un-typeable

DISCUSSION

The Centers for Disease Control and Prevention in Atlanta, Georgia, USA (CDC) have stated that in occupational settings in which workers may be routinely exposed to blood or other body fluids are at increased risk for occupational acquisition of HBV infection. After occupational exposure to people having infectious diseases like HCV manifold the risk of having HCV for the beautician and barbers [16].

Many workers consider infection with HCV to be an occupational hazard for barbers [4, 17]. Other researchers consider barbers a source of infection to their clients, especially when there is reuse of razor blades that may transmit infection through micro-trauma [18]. However, others found no relation between shaving by community barbers and infection with transmission of viral hepatitis [20]. Ozdemir et al. 2004 concluded that HBV and HCV infections are not occupational risks for barbers and hairdressers [19].

Razors, barber's scissors, nail files and body piercing instruments are risk factors responsible for the spread of hepatitis C [21]. Barbers are also involved in circumcision, incision, and drainage of abscesses, especially in rural areas. A report showed that only 13% of them knew that hepatitis C are diseases of the liver, causing cancer[4]. In this study mean age of barbers and beauticians who were reactive for Anti-HCV was 40.33±13.56 with an age range of 40 years (16-56 years). Mean age of male and female barbers and beauticians was 29.30±9.92 and 30.00±6.89 years respectively, with significant difference with respect to gender (p-value<0.05). Male to female ratio for reactive individuals among barbers was 1:2. According to the results reported by Fida et al, age distribution for reactive barbers was similar to the results of this study.

According to a study done by Ashraf et al. 2010 in Pakistan there was 58 (56%) males and 45 (43%) females in the study, which shows a higher proportion of patients in males [22]. On the basis of the results of the study it is obvious that males have a higher proportion in hepatitis C. It might be because of the fact that males have more access to go out in society and also for frequent haircuts and shaving by barbers and hair dressers.

In our study the prevalence of HCV in barbers and beauticians was 6.97 % having lower literacy rate. In developing countries like Pakistan, most of the barbers are illiterate and unoblivious of transmission of infectious agents through the repeated use of razors and scissors [23]. Education of barbers about the significance of sterilization of their instruments may help in reducing the burden of community-acquired infection with HBV and other blood-

borne pathogens.Bari et al identified the risk factors for transmission of HCV were facial and armpit shaving [24].

Study done by Shalaby in Egypt revealed a higher prevalence of HCV infection among barbers and clients of rural areas than urban ones[12]. In addition, it also observed that the seroprevalence rates of HCV were much higher in villages in the Nile Delta region compared with Upper Egypt and this was correlated with the difference in schistosomiasis infection rates in both regions [25, 26].

It has been suspected that barbers may be contributing to the spread of HBV and HCV by using contaminated razors for shaving. Janjua and Nizamy, 2004 in a cross-sectional study of barbers in Rawalpindi/Islamabad in 1999, showed that only 13% of barbers had the knowledge about the transmission of hepatitis. During the actual observation, razors were reused for 46% of shaves. Hence, skin abrasions and micro trauma during shave has been reported as a significant predictor for acquiring hepatitis C infection [4].

Multiple studies had done in different groups of people in Lahore, Pakistan to predict the risk factors of HCV infection. These studies concluded major risk factors which were, barber shaves, dental procedure, sharing of tooth brushes and house hold items [27, 28, 29]. Though HCV is blood borne diseases, it appears that the virus is coming from the community to the house hold members and the possible sources are treating physicians using a reused syringe, dentists and barbers [4].

REFERENCE

1. Habib M, Mohamed MK, Abdel-Aziz F, Magder LS, Abdel-Hamid M, Gamil F, Madkour S, Mikhail NN, Anwar W, Strickland GT, Fix AD, Sallam I. Hepatitis C virus infection in a community in the Nile Delta: risk factors for seropositivity. Hepatology 2001. 33(1):248-53.

2. Candan F, Alagözlü H, Poyraz O and Sümer H. Prevalence of hepatitis B and C virus infection in barbers in the Sivas region of Turkey. Occup Med (Lond) 2002. 52(1):31-4.

3. Villar LM, de Paula VS, de Almeida AJ, do Ó KMR, Miguel JC, Lampe E. Knowledge and prevalence of viral hepatitis among beauticians. J Med Virol, 2014; 86: 1515–1521.

4. Janjua NZ and Nizamy MA. 2004. Knowledge and practic es of barbers about hepatitis B and C transmission in Rawalpindi and Islamabad. J Pak Med Assoc. 54:116-9.

5. Khan MSA, Khalid M, Ayub N and Javed M. Seroprevalence and risk factors of Hepatitis C Virus (HCV) in Mardan, N.W.F.P: A hospital based study. Rawal Med J 2004. 29: 57-60.

6. Murtagh J, Foerster V. 2006. Transient elastography (FibroScan) for non-invasive assessment of liver fibrosis. Issues Emerg Health Technol. 90:1-4.

7. Karmochkine M, Carrat F, Santos OD, Cacoub P and Raguin GA. 2006. Case-Control Study of Risk Factors for Hepatitis C Infection in Patients with Unexplained Routes of Infection, J Viral Hepat. 13(11):775-782.

8. Wazir MS, Mehmood S, Ahmed A and Jadoon HR. 2008. Awareness among barbers about health hazards associated with their profession. J Ayub Med Coll Abbottabad. 20(2): 35-38.

9. Ali M, Kanwal L, Tassaduqe K and Iqbal R. 2009. Prevalence of Hepatitis C Virus (HCV) in Relation to Its Promotive Factors Among Human Urban Population of Multan, Pakistan. Eur J Gen Med. 6(2):94-98.

10. Akbar H, Idrees M, Manzoor S, Rehman I, Butt S, Yousaf MZ, Rafique S, Awan Z, Khubaib B, Akram, M and Aftab, M. Hepatitis C virus infection: A review of the current and future aspects and concerns in Pakistan. J Gen Mol Viro 2009; 1(2) 12-18.

11. Chaudhry MA, Rizvi F, Afzal M, Ashraf MZ, Niazi S, Beg A, Kharal TH. Frequency of Risk Factors for Hepatitis B (HBV) and Hepatitis C Virus (HCV). Ann. Pak. Inst. Med. Sci. 2010; 6(3): 161-163.

12. Shalaby S., Kabbash I.A., Saleet G. E, Mansour N., Omar and A., Nawawy AE. Hepatitis B and C viral infection: prevalence, knowledge, attitude and practice among barbers and clients in Gharbia governorate, Egypt. EMHJ 2010; 16(1):10-17.

13. Belbacha I, Cherkaoui I, Akrim M, DooleyKE and Aouad REI. Seroprevalence of hepatitis B and C among barbers and their clients in the Rabat region of Morocco. EMHJ 2011; 17(12): 911-919.

14. Kose S, Mandiracioglu A, Oral AM, Emek M, Gozaydin A, Kuzucu L and Turken M. Seroprevalence of hepatitis B and C viruses: Awareness and safe practices of hairdressers in Izmir — A survey. Int J Occup Med Environ Health 2011; 24(3):275-282.

15. Okonko IO, Oyediji TO, Anugweje KC, Adeniji FO, Alli JA and Abraham OA. Detection of HCV antibody among intending blood donors. Nature and Science 2012; 10(1):53-58.

16. Gerberding JL. Management of occupational exposures to blood-borne viruses. N. Engl. J. Med 1996; 332: 444-451.

17. Mele A. Beauty treatments and risk of parenterally transmitted hepatitis: results from the hepatitis surveillance system in Italy. Scandinavian journal of infectious diseases 1995; 27(5):441–4.

18. Rashid H, Shafi S. Blood borne hepatitis at Hajj. 23. Hepatitis monthly 2006; 6(2):87–8.

19. Ozdemir FN, Akcay A, Sezer S, Boyacioglu S, Ozdemir BH, Arat Z, Haberal M. A six-year follow-up after interferon-alpha monotherapy for chronic hepatitis C infection in hemodialysis patients. Ren Fail 2004; 26(5):583-8.

20. Medhat A et al. Hepatitis C in a community in Upper Egypt: risk factors for infection. American journal of tropical medicine and hygiene 2002; 66(5):633–8.

21. Thirdage.com. Can Salons Spread Infection? Available via: www.thirdage.com/skin-hair-nails/cansalons-spread-infection-0. Accessed 23 Jul 2009.

22. Ashraf C, Rizvi F, Ashraf MZ, Afzal M and Niazi S. Knowledge and practices of barbers regarding hepatitis B and hepatitisC in BahraKahu, Islamabad-Pakistan. Rawal Medical Journal 2010; 35(1):37-40.

23. Khaliq AA, Smego RA. Barber shaving and blood-borne disease transmission in developing countries. S Afr Med J 2005; 95: 94-96.

24. Bari A, Akhtar S, Rahbar MH and Luby SP. Risk factors for hepatitis C virus infection in male adults in Rawalpindi Islamabad, Pakistan. Trop Med Int Health 2001. 6:732-8.

25. Nafeh MH et al. Hepatitis C in a community in Upper Egypt: Cross-sectional survey. American journal of tropical medicine and hygiene 2000; 63(5–6):236–41.

26. Rao MR et al. Further evidence for association of hepatitis C. Infection with parenteral schistosomiasis treatment in Egypt. BMC infectious diseases, 2000; 2:29.

27. Akhtar, A.M., M. A Khan, T. Ijaz, Z.Iqbal. et al. Seroprevalence and Determinants of Hepatitis-C Virus Infection in Blood Donors of Lahore, Pakistan. Pakistan J. Zool. 2013; 44(5): 1085-12.

28. Akhtar, A.M., M.A Khan, T. Ijaz, A. Maqbool, Z. Iqbal, A. Rehman and S. Majeed. Hepatitis C virus infection in pregnant women in Lahore, Pakistan: an analytical cross sectional study. Int. J. Agric. Biol. 2014; 16: 160–164.

29. Akhtar A.M., Sadia M., Muhammad J.A. Prevalence of Hepatitis C Virus Infection and Associated Risk Factors in Long Distance Truck Drivers in Lahore. Sci.Int. 2014; 27(2),1433-1437.