DOI: https://doi.org/10.53350/pjmhs211571794

ORIGINAL ARTICLE

Prevalence of Hepatitis B and C among Tuberculosis Patients at Local Community of Sindh, Pakistan

KHALIL AHMED MEMON[1], MUHAMMAD KHAN[2], SARAH AZHAR[3], JAI KERSHAN[4], PARTAB PURI[5], BENAZEER BHATTI[6], MUDASSAR IQBAL ARAIN[7], SAIRA SHAHNAZ[8]

[1]Lecturer,Department of Pathology, Liaquat University of Medical & Health Sciences,Jamshoro, Sindh, Pakistan
[2,3]Assistant Professors, Department of Pathology, Baqai Medical College Karachi, Sindh, Pakistan
[4]Assistant Professor, Department of Community Medicine, United Medical & Dental College and Creek General Hospital Karachi, Sindh
[5]Assistant Professor, Department of Community Medicine, Muhammad Medical College, Mirpurkhas, Sindh, Pakistan
[6]M. Phil Trainee, Department of Pathology, Liaquat University of Medical & Health Sciences, Jamshoro, Sindh
[7]Assistant Professor, Department of Pharmacy Practice Faculty of Pharmacy, University of Sindh, Jamshoro
[8]AssistantmProfessor, Department of Pharmacy Practice Faculty of Pharmacy, Nazeer Hussain University Karachi
Correspondence to: Dr Khalil Ahmed Memon, Cell 0300-3020240, Email: drkmemon@yahoo.com

ABSTRACT

Objective: To assess the prevalence rate of Hepatitis B and C among those patients who had tuberculosis in local community of Sindh, Pakistan.

Study Design: Survey-based study

Place and Duration of Study: Department of Pathology, Liaquat University of Medical & health Sciences Jamshoro from 1st January 2020 to 31st December 2020.

Methodology: Five hundred and eighty nine confirmed cases of tuberculosis patients were enrolled. The patients were further analyzed to assess either HBV, HCV or both are present or absent.

Results: Three hundred and forty one **(**57.8%) were males and 248 (42.1%) were females. The majority of participants were in the age group of 45-54 years 147 (24.9%).The residence detail showed that 167 (28.3%) belonged to urban areas. Further 143 (24.2%) had sickness history of 2-6 months, 239 (40.5%) had history of 6-12 months, The prevalence of hepatitis B and C among tuberculosis patients showed, 17.8% (n=105) with Hepatitis B, 26.3% (n=155) were diagnosed with hepatitis C, 15.7% (n=93) had Both Hepatitis B and C, however 236 (40.0%) had no history with hepatitis. Hepatitis C was most frequently found age of above 54 years, 55 (9.3%).

Conclusion: The control of tuberculosis has remained one of the greatest goals globally till date, the higher risk of liver complications, along with the Hepatitis B and Hepatitis C. Although the complications of Tuberculosis patients remain unsolved yet the possible efforts can be made to identify the earlier problems for the clinical prospective and a complete follow up of the records can optimize the management of Tuberculosis in co-existing conditions of hepatitis B and C.

Key Words: Hepatitis B, Hepatitis C, Tuberculosis, Liver diseases

INTRODUCTION

Liver disorders due to virus are one of the health-challenging problems. Hepatitis B and C are widely distributed in developed and under developed countries. This virus has spread by unsafe shaving kits by barbers, dental surgeries and injections[1-2]. Millions of patients are infected by unsafe injections every year throughout the world.[3] HBV and HCV had clinically same symptoms such as abdominal pain, fatigue, jaundice and abnormal value of liver function test.[4] As compared to HBV, HCV is also termed as silent virus particularly under 30 years of age without any symptoms. Many complications are present due to HBV and HCV but the most common are portal hypertension and Cirrhosis that leads to mortality.[5-6]The prevalence rate of HBV and HCV is different in different countries such as in India 2 billion peoples are infected with HBV while in Japan the ratio is 2.78 out of 0.1 million peoples.[7-8]

In Pakistan near about 7 million peoples are infected by HBV and in China 10% of the population are suffering from HBV.[9]Humans are living in uncountable colonies of microorganisms and viruses. The one major threat for humans are viruses i.e. Hepatitis B and C virus[10] particularly in Asian and African countries. Various studies suggested thatnear about two billion are infected by HBV and four hundred million are in chronic phase.[11] The high spread of virus become endemic in many countries. In Pakistan, HBV become endemic with more than nine million peoples. The infection rate is increased due to many reasons such as poor economic condition, insufficient knowledge and awareness regarding communicable disease.[12]Like HBV and HCV, Tuberculosis (TB) is also a challenging health problem in both under-developed and developed countries. Number of co-infections are associated with TB such as HIV, HBV and HCV. The rate of TB is twenty time more in HIV infections.[13] Those areas where TB rate is high and termed as hotspots, the infection rate of HBV is also high estimated by WHO in two sub continents i.e., Africa and South Asia.[14]

The rate of morbidities and mortalities are higher when TB and HCV co-infection present in a patient. The exact mechanism is still unknown but studies suggested that more chances to develop TB disease who had HCV infection.[2] In chronic liver disease, Hepatotoxicity risk is greatly increase in those patients who are taking anti tuberculosis treatment. The chances of hepatotoxicity are more 5 times more as compared to those who had no CKD problem.[3] In patients of HCV with HIV, the hepatotoxicity is fourteen times more for anti-tuberculosis treatment.[15] According to the study the prevalence rate of HB surface

antigen was more than 8% and HCV were more than 14 % in patient who had confirmed TB in north region of Nigeria while in south region, HBsAg was up to 15% and HCV up to 7%[16]. The association between HCV and TB is not studies extensively globally and only small number of studies are available. Current study focused to estimate the rate of prevalence of HBV and HCV in tuberculosis patients.

MATERIALS AND METHODS

The survey-based study was conducted on tuberculosis patients. It is seroprevalence type in which hepatitis B and C virus were analyzed. Those patients who had confirmed diagnosis of TB were included the study. The patients were further analyzed to assess either HBV, HCV or both are present or absent. A total of 589 TB patients were recruited. The written informed consent was taken from the hospitals as well as patients. The study site was various district hospitals of Sindh, Pakistan. The data were collected with the help of cross-sectional design and then transferred in data collection sheet. The information related to demographic, prevalence of HBV and HCV were noted. Elisa and PCR methods were used for detection of virus in TB patients. The data were analyzed with the help of SPSS version 21.

RESULTS

There were 341 (57.8%) malesand 248 (42.1%) were females. The majority of participants 147 (24.9%) were belonged to age group of 45-54 years, 57 (9.6%) were 15-24 years old, 74 (12.5%) were 25-34 years, 124 (21.0%) 35-44 years, while 187 (31.7%) were above the age of 54 years. The residence detail showed that 167 (28.3%) belonged to urban areas, 622 (71.6%) from rural area. One hundred and forty three (24.2%) had sickness history of 2-6 months, 239 (40.5%) had history of 6-12 months, however 207 (35.1%) had history of previous diagnosis of more than 1 years (Table 1).

Table1: Demographic information of patients (n=589)

Variable	No.	%	P value
Gender			
Male	341	57.8	0.001
Female	248	42.2	
Age (years)			
15-24	57	9.6	0.023
25-34	74	12.5	
35-44	124	21.0	
45-54	147	24.9	
>54	187	31.7	
Locality			
Urban	167	28.3	0.033
Rural	422	71.6	
Employment status			
Employed	228	38.7	0.032
Unemployed	361	61.2	
Duration of sickness prior to diagnosis			
2-6months	143	24.2	0.005
6-12months	239	40.5	
>1 year	207	35.1	
Smoking status			
Yes	278	47.1	0.001
No	311	52.8	

The prevalence of hepatitis B and C, among tuberculosis patients showed, 105 (17.8%) with Hepatitis B, 155 (26.3%) were diagnosed with hepatitis C, 93 (15.7%) had Both Hepatitis B and C, however 236 (40.0%) had no history with hepatitis (Table 2). The prevalence of Hepatitis B and C among T.B patients with respect to gender, mostly male patients were more hepatitis C prevalence as compared to hepatitis B (Table 3).Mostly hepatitis C was detected among those tuberculosis patients who have positive smoking status, showed the prevalence of Hepatitis B and C among T.B patients with respect to smoking status (Table 4). The relationship of age with hepatitis B among different age groups showed 5 (0.8%) age groups 15-24 years. Hepatitis C was most frequently found age of above 54 years, 55 (9.3%) [Table 5].

Table2: Prevalence of hepatitis B and C among TB patients (n=589)

Prevalence of Hepatitis	No.	%
Hepatitis B	105	17.8
Hepatitis C	155	26.3
Both Hepatitis B and C	93	15.7
No any type of Hepatitis	236	40.0

Table3: Prevalence of Hepatitis B and C among TB patients with respect to gender

Prevalence of Hepatitis	Gender	No.	%	P value
Hepatitis B (n=105)	Male	76	12.9	0.023
	Female	29	4.9	
Hepatitis C (n=155)	Male	108	18.3	0.001
	Female	47	7.9	
Both Hepatitis B & C (n=93)	Male	33	5.6	0.054
	Female	60	10.1	
No any type of Hepatitis (n=236)	Male	124	21.0	0.004
	Female	112	19.0	

Table4: Prevalence of hepatitis B and C among TB patients with respect to smoking status

Prevalence of Hepatitis	Smoking (n=278)	No.	%
Hepatitis B (n=105)	Yes	54	9.1
	No	51	8.6
Hepatitis C (n=155)	Yes	87	14.7
	No	68	11.5
Both Hepatitis B & C (n=93)	Yes	62	10.5
	No	31	5.2
No any type of Hepatitis (n=236)	Yes	75	12.7
	No	161	27.3

Table5: Prevalence of hepatitis B and C among TB patients with respect to age

Prevalence of Hepatitis	Age (years)	No.	%	P value
Hepatitis B (n=105)	15-24	5	0.8	0.002
	25-34	11	1.8	
	35-44	17	2.8	
	45-54	30	5.2	
	> 54	42	7.2	
Hepatitis C (n=155)	15-24	15	2.5	0.001
	25-34	14	2.3	
	35-44	32	5.4	
	45-54	39	6.6	
	> 54	55	9.3	
Both Hepatitis B & C (n=93)	15-24	8	1.3	0.023
	25-34	7	1.1	
	35-44	22	3.7	
	45-54	24	4.0	
	> 54	32	5.4	
No any type of Hepatitis (n=236)	15-24	29	4.9	0.001
	25-34	42	7.1	
	35-44	53	8.9	
	45-54	54	9.1	
	> 54	58	9.8	

DISCUSSION

The study was conducted to assess the extent of Hepatitis B and C among the tuberculosis patients. The pathogens

which are blood-borne in nature like HBV and their exposure is very risky and dangerous to tuberculosis patients in all health care settings, specifically in the zone and regions of the globe where these pathogens are high at its prevalence and where these infections are epidemic.[4-6] the prevalence of infectious disease was similar to the past study gender wise[17] since majority of male population were observed during the study.

The tuberculosis patient's data interpreted the majority of patient's lied in the age group of 45-54 years the results are similar to the study conducted in different region to assess the more effected age group with hepatitis B and C.[18]Generally the patients of the current study were moderately young, which shows the great agreement of the results with other study and also confirms that the disease tuberculosis is kind of economically productive disease age-wise.[19]The age is consider as the continuously growing risk for the development of Hepatitis, thus it can be stated that age is one of a potential factors for hepatitis C. In order to assess the type of hepatitis among TB patient's, generally the patients in our study were categorized into four different categories of hepatitis, the data showed majority were diagnosed previously with the Hepatitis C, which response was 155 patients, however the Hepatitis B was found in the history of 105 patient's. Our study's finding and results were in consistency with the study from Ethiopia when it comes to knowledge and transmission of virus but it was inconsistent when it comes vaccination and screening against virus.[20] The duration of sickness was also assessed in previously conducted study[21], which are in agreement with the present study, The majority had sickness and symptoms for 6-12 months however the results showed that 207 patients had sickness more than the period of 1 year which can be positively compare with past studies.[22,23]The smoking status also linked with lungs diseases like tuberculosis , hence previously conducted studies showed the major association with smoking status, out of total enrolled patients 278 had positive history with smoking.[24]

The health-related intervention log with its methods and also outlines the policies of public health. The clinical manifestation for majority of the patients showed the similar response as in other study.[25.]The prevalence of co-infection Hepatitis B C, and tuberculosis patients was found comparatively low in our study[26], which can be explained in context to the study as negative history of other contributing factors such as blood transfusion, different injectable products and sexual interactions as explained by researchers of the study.[27] The frequency of extrapulmonary tuberculosis in association to the hepatitis B, and Hepatitis C is comparatively low in our areas of residences, however the smoking factor cannot be ignore at this stage, which might leads to the development of serious liver diseases like liver cirrhosis as explained by the study.[28]

Apart from fact that the professional and the occupational background is quite large, the results of the current study suggest that overall knowledge is adequate towards the HBV and C infection and its mode of transmission. Many of the participants were aware that infected blood, body fluids, needles that are contaminated, sexual contact which is unsafe are the prominent risk towards acquiring the infection causing liver damage.[29] Our findings and study suggest that there is a crucial need of providing complete and good knowledge and aware the community utterly with HBV and HCV infection.[30] It also recommends that governing bodies should also help in reducing the fear which halts the students to treat and cure the infected patients. However, immunization is adequate enough among the trainees.

CONCLUSION

The control of tuberculosis has remained one of the greatest goals globally till date, the higher risk of liver complications alongwith the Hepatitis B and Hepatitis C. Although the complications of Tuberculosis patients remain unsolved yet the possible efforts can be made to identify the earlier problems for the clinical prospective and a complete follow up of the records can optimize the management of Tuberculosis in co-existing conditions of hepatitis B and C.

REFERENCES

1. Hayashmi J, Kishiharar Y, Yamaji K, Yoshimura E,Yawakami Y, Akazawa K, et al. Transmission of hepatitisC virus by health care workers in rural area ofJapan. Am J Gastroenterol 1995;90:794-9.
2. Khuwaja AK, Qureshi R, Fatimi Z. Knowledge abouthepatitis B and C among patients attending familymedicine clinic in Karachi. East Mediterr Health J2002;8(6):1-6.
3. Kane A, Lloyd J, Zaffran M, Simonsen L, Kane M.Transmission of hepatitis B, hepatitis C and humanimmuno deficiency viruses through unsafe injectionsin the developing world. Model-based regional estimates.BullWHO1999;(77):10.
4. Russel RCG, Williams NS, Bulstrode CJK, editors. TheLiver. In: Bailey and Loves" Short Practise of Surgery,24th ed. London: Chapman and Haal 2004;1076.
5. Seef LB. Natural history of hepatitis C. Am J Med1999;107:10-15.
6. Cuschieri SA, Steele RJC, Moosa AR, editors. Essentialsurgical practice, 4th ed. London: Arnold; 2002.
7. Lok AS, Heathcote EJ, Hoofnagle JH. Management ofhepatitis B: 2000 - Summary of a workshop. Gastroenterology2001;120:1828-53.
8. Lavanchy D. Public health measures in the control ofviral hepatitis: A world health organization perspectivefor the next millennium. J Gastroenterol Hepatol2002;17-S4:s452-9.
9. Hayes PC, Sympson KJ, Garden OJ, ed.Davidson's principles and practice of medicine; 19thed. Philadelphia: Churchill Livingston; 2002.
10. Abhijit Chowdhury. Epidemiology of hepatitis Bvirus infection in India. Hepatitis B Annual2004;1(1):17-24.
11. Ali NS, Jamal K, Qureshi R. Hepatitis B vaccinationstatus and identification of risk factors for Hepatitis Bin health care workers. J Coll Physicians Surg Pak2005;15(5):257-60.
12. Idrees M, khan S, Riazuddin S: Common genotypes of hepatitis B virus. J Coll Phy Sur Pak 2004, 14:344-7.
13. Zhu R, Zhang H, Yu H, Li H, Ling YQ, Hu XQ, Zhu HG: Hepatitis B virus mutations associated with in situ expression of hepatitis B core antigen, viral load and prognosis in chronic hepatitis B patients. Pathol Res Pract 2008, 204:731-742.
14. Ali L, Idrees M, Ali M, Rehman I, Hussain A, Afzal S, et al. An overview of treatment response rates to various anti-viral drugs in Pakistani hepatitis B virus infected patients. Virology J 2011; 8:20.
15. Li G, Li W, Guo F, Xuc S, Zhaod N, Chena S, Liu L. A novel real-time PCR assay for determination of viral loads in

person infected with hepatitis B virus. J Virol Meth 2010; 165:9-14.
16. Paraskevis D, Haida C, Tassopoulos N, Raptopoulou M, Tsantoulas D, Papachristou H, et al. Development and assessment of a novel real-time PCR assay for quantitation of HBV DNA. J Virol Meth 2002; 103:201-212.
17. Alam MM, Zaidi SZ, Malik SA, Naeem A, Shaukat S, Sharif S, et al. Serology based disease status of Pakistani population infected with Hepatitis B virus. BMC Infect Dis 2007; 7:64.
18. World Health Organization. Global tuberculosis control: Epidemiology, strategy, financing. WHO Report. Geneva, Switzerland: 2009.
19. World Health Organization. Global alert and response: Hepatitis B. Geneva: WHO, 2002.
20. Wu PH, Lin YT, Hsieh KP, et al. Hepatitis C virus infection associated with an increased risk of active tuberculosis disease: A nationwide population based study. Medicine (Baltimore) 2015; 94 (33):e1328.
21. Yew WW, Leung CC. Anti-tuberculosis drugs and hepatotoxicity. Respirology 2006; 11: 699-707.
22. Saukkonen JJ, Cohn DL, Jasmer RM, et al. An Official ATS Statement: hepatotoxity of anti- tuberculosis therapy. Am J Respir Crit Care Med 2006; 174(8):935-52.
23. Taura DW, Hassan A, Dahiru M, et al. Hospital prevalence of hepatitis B and C co-infection with tuberculosis: A case study of Aminu Kano Teaching Hospital, Kano, Nigeria. IJES 2013; 2(12):54-7.
24. Richards DC, Mikiashvili T, Parris JJ, Kourbatova EV, Wilson JCE et al. High prevalence of hepatitis C virus but not HIV co-infection among patients with tuberculosis in Georgia. IntJTuberculosis Lung Dis 2006; 10: 396-401.
25. Merza MA, Haji SM, Alsharafani AMH, Muhammed SU. Low prevalence of hepatitis B and C among tuberculosis patients in Duhok Province, Kurdistan: Are HBsAg and anti-HCV prerequisite screening parameters in tuberculosis control program?.Int J Mycobacteriol2016; *5*(3): 313-7.
26. Feleke BE, Feleke TE, Adane WG, Girma A. Impacts of hepatitis B and hepatitis C co-infection with tuberculosis, a prospective cohort study.VirolJ 2020; 17(1): 1-8.
27. Chen L, Bao D, Gu L, Gu Y, Zhou L, Gao Z, Huang Y. Co-infection with hepatitis B virus among tuberculosis patients is associated with poor outcomes during anti-tuberculosis treatment. BMC Infec Dis 2018; 18(1), 1-10.
28. Aires RS, Matos MAD, Lopes CLR, Teles SA, Kozlowski AG, Silva AMC, et al. Prevalence of hepatitis B virus infection among tuberculosis patients with or without HIV in Goiânia City, Brazil.JClinVirol2012; 54(4): 327-31.
29. Kuniholm MH, MarkJ, Aladashvili M, Shubladze N, Khechinashvili G, Tsertsvadze T, et al. Risk factors and algorithms to identify hepatitis C, hepatitis B, and HIV among Georgian tuberculosis patients.IntJInfecDis2008; 12(1): 51-6.
30. Mengesha E, Airgecho T, Negera E, Kebede M. Prevalence of triple viral infections of human immunodeficiency virus (HIV), hepatitis B and C among tuberculosis patients and associated risk factors: the case of west Arsi zone, Ethiopia. Afr JMicrobiolRes 2015; 9(26): 1675-83.