



To Evaluate the Frequency of Diabetes Mellitus Patients with Hepatitis C at Tertiary Hospital of Sindh, Pakistan

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Authors' contributions

This work was carried out in collaboration among all authors. Authors KKM and FQR designed the study, performed the statistical analysis, wrote the protocol and wrote the first draft of the manuscript. Authors KU and MTB managed the analyses of the study. Author AAU managed the literature searches. All authors read and approved the final manuscript.

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ABSTRACT

Objective: The major theme of the research was to evaluate the frequency of diabetes mellitus patients with hepatitis C infection at tertiary care hospital of Sindh, Pakistan.

Methodology: Descriptive cross sectional study was conducted at tertiary care hospital of Sindh, Pakistan for the period of 08 months; total 374 sample size was calculated by using Rao soft sample size calculator at the prevalence rate of 58.3% and confidence level 95% and margin of error 5%. Data was collected from patients of sero-positive HCV-RNA (Hepatitis C Virus-Ribose Nucleic Acid) visiting outpatient department or admitted at tertiary care hospital of Sindh, Pakistan and Informed consent form was also filled from all included subjects and data was analyzed by

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using SPSS software version 24.00.

Results: From the 374 patients 209 were males and 165 females and all participants were divided in to various age groups as 15 patients were in the age group of 20-25 years, 67 patients were in 26-30 years, 48 patients included in 31-35 years and 109 patients were included in to age group of 36-40 years. Only 12 patients were included in the age group of 50 years and above. Total 164 (43.85%) were diabetic and 229 (61.22%) were diagnosed with Hepatitis C RNA (Ribose Nucleic Acid) positive. Patients had various range of HbA1c as 93 patients had range between 6-7mmol/dl. 107(28.60%) included in 7-9mmol/dl, 145(38.77%) included in 9-11mmol/dl and only 29 patients were having HbA1c (Glycated Hemoglobin) level above 11mmol/dl.

Conclusion: It was concluded that there were increased number of diabetic patients with hepatitis C in worsening condition, so the proper programs should be conducted in order to reduce the complication of co-morbid disease.

Keywords: Chronic liver disease; diabetes mellitus; Hepatitis C.

1. INTRODUCTION

Worldwide, Hepatitis is considered as most infectious disease that affects approximately 5% of population and 35 million people dying every year just because of Hepatitis C and related type infectious diseases [1,2]. Prevalence rate of Hepatitis C in Pakistan is 5% and its rate is increasing on daily basis just because of sharing infected things as it is considered as air borne disease and easily transfers from person to person [3,4]. Almost 180 million were suspected to have liver cirrhosis and liver cancer every year around the globe. The major cause of liver cancer is Hepatitis as per recommendation of World Health Organization [5,6]. According to mortality rate described by world health organization diabetes mellitus got eighth position in 2013. Near about 3-4 million people died every year due to diabetes mellitus and in Pakistan the frequency of diabetes is increased in general population [7,8].

According to numerous research studies, liver infections increased the glycemic level due to producing the insulin resistance but the mechanism is still unknown but the research studies recommend that there is direct interaction of Hepatitis with receptor of insulin via pro-inflammatory cytokines [9,10]. Ethawary et al. had found in HCV sero-positive patients, 13.84% of patients had diabetes mellitus. Sindhu et al. elaborated about the strong co-relation among the patients of hepatitis C and Diabetes Mellitus. [11] According to observational research conducted by Ansari et al. found Diabetes in 60% of patients with HCV patients [12,13] According to recent approach of research, it was concluded that Diabetes management is directly proportional to the Liver disorders and its symptoms become worsen within a person who

have hepatitis or related disorders [14,15]. Insulin resistance is considered as severe pathogenic factor that produces hindrances in the signaling within cells of livers, beside this secretion of inflammatory mediators and oxidative stress are considered as related factors involved for the worsening condition of Diabetes among the hepatitis patients [16,17]. According to report published in Pakistan Medical Research Council, there is increased number of patients of Hepatitis with diabetes as compared to diabetic patients without hepatitis [18]. So, the major theme of research was to evaluate the frequency of patients of hepatitis with diabetes, as to estimate the complication and co-morbid condition can be achieved [19,20]

2. METHODOLOGY

Descriptive cross sectional study was conducted at tertiary care hospital of Sindh, Pakistan for the period of 08 months from February 2020 to September 2020 and total 374 sample size was calculated by using Rao soft sample size calculator at the prevalence rate of 58.3% and confidence level 95% and margin of error 5%. Diabetes was diagnosed by different diagnostic test including Random glucose test and fasting glucose test and Hepatitis was also confirmed through various lab test including liver functioning test & HCV antibodies test. Data was collected from patients of sero-positive HCV-RNA visiting outpatient department or admitted at tertiary care hospital of Sindh, Pakistan and Informed consent form was also filled from all included subjects and data was analyzed by using SPSS software version 24.00.

3. RESULTS

Research was conducted on 374 patients who were either admitted in Medicine ward or come

for OPD (Outdoor Patient Department) at Medicine Department of Tertiary care hospital of Sindh, Pakistan. Patients with diabetes mellitus along with Hepatitis C were selected for the study and 209 were males whereas 165 were females as mentioned in Table 1.

Table 1. Gender wise distribution of study subjects

Gender	Number	Frequency
Male	209	55.88%
Female	165	43.85%

Table 2. Age wise distribution of study subjects

Age group	Number	Frequency
20-25years	15	4.01%
26-30years	67	17.91%
31-35years	48	12.83%
36-40years	109	29.14%
41-45years	74	19.7%
46-50years	49	13.10%
50 years and Above	12	3.20%

4. DISCUSSION

Globally, severe liver infections are considered as route cause for increased disease and death ratio and it had prevalence rate of approximately 15%. The frequency of death with liver problems was about 20 individuals per 1 lac. The prevalence rate among hepatitis patients was approximately 14%. Globally, the prevalence rate of diabetes is almost 10% among the local population with equal division in each gender. The general health issues including Diabetes and Hepatitis pretense bad impact on the health of local population specially when these types of co-morbid occurs together simultaneously. In current research the occurrence of diabetes among the hepatitis C patients was quite greater than the expected values. From the given figure 62% people were newly diagnostic cases whereas 38% people were previously diabetic people. These diabetic people were totally depending on the diets not on any medications. In previous literatures, the prevalence of hepatitis C among diabetic people had shown with wide range from 15-65% [12-13]. Anjum et al. had revealed 39% frequency of impaired diabetic level among the patients of hepatitis C. Huang et al. revealed the enhanced frequency of type II diabetes with hepatic problems compared with non-diabetic people. There were enhanced risk factors for creating hepatic cancer conditions

among the patients with and without diabetes. Numerous clinical trials on the hepatic issues had revealed that enhanced management therapy for glycemic control even after taking medication for the management of Hepatitis C.

Table 3. Area wise distribution of study subjects

Area of residency	Number	Frequency
Rural	197	52.67%
Urban	177	47.32%

Table 4. Qualification wise distribution of study subjects

Qualification	Number	Frequency
Primary	119	31.81%
Secondary	98	26.20%
Graduate	81	21.65%
Illiterate	76	20.32%

Table 5. Diagnosis of diabetes among study subjects

Diagnosis	Number	Frequency
Diabetic	164	43.85%
Non-diabetic	210	56.14%

Table 6. Screening of HCV from study subjects

Diagnosis	Number	Frequency
Sero-positive HCV	229	61.22%
Sero-negative HCV	145	38.77%

Table 7. Adverse effects of diabetes reported among study subjects

Side and adverse effects	Number	Frequency
Hypoglycemia	140	37.43%
Hyperglycemia	151	40.37%
Micro-complication	26	6.95%
Macro-complication	57	15.24%

Table 8. Adverse effects of hepatitis reported among study subjects

Effects	Number	Frequency
Fade of color	107	28.60%
Yellowish eyes	91	24.33%
Abdominal cramps	27	7.21%
Constipation	100	26.73%
Dyrrhea/dysentry	49	13.10%

Table 9. Management of diabetes among study subjects

Management Options	Number	Frequency
Diet control	17	4.54%
Life style modification	53	14.17%
Oral medication	201	53.74%
Insulin	103	27.54%

5. CONCLUSION

From the current study, it was concluded that recently diagnosed diabetic cases had found among the people with hepatitis C. So, further researches are compulsory to enhance the sufficient and cost related seminars for the management of Diabetes mellitus that gave proper reactions against to antiviral therapy, when the diabetes is not managed properly.

CONSENT

As per international standard or university standard, patients' written consent has been collected and preserved by the author(s).

ETHICAL APPROVAL

As per international standard or university standard written ethical approval has been collected and preserved by the author(s).

COMPETING INTERESTS

Authors have declared that no competing interests exist.

REFERENCES

- Losurdo G, Iannone A, Contaldo A, Barone M, Ierardi E, Di Leo A, Principi M. Chronic viral hepatitis in a cohort of inflammatory bowel disease patients from Southern Italy: A case-control study. *Pathogens*. 2020; 9(11):870.
- Ali K, Memon S, Badar A, Zarrar M, Muhammad Y, Shaikh NS. Diabetes mellitus in Hepatitis C patients presenting to tertiary care facility, Nawabshah. *Annals of Punjab Medical College (APMC)*. 2020; 14(1):58-61.
- Yousaf MK, Nourin S, Khan A, Yousaf MI, Ullah SA, Lodhi S. Diabetes Mellitus Among Patients with Cirrhosis Due to Hepatitis C Virus and its Association with Hepatic Encephalopathy. *Annals of King Edward Medical University*. 2020;26(1):36-40.
- Doneddu PE, Cocito D, Manganeli F, Fazio R, Briani C, Filosto M, et al. Frequency of diabetes and other comorbidities in chronic inflammatory demyelinating polyradiculoneuropathy and their impact on clinical presentation and response to therapy. *Journal of Neurology, Neurosurgery & Psychiatry*. 2020;91(10):1092-9.
- Saddique M, Laique T. Frequency with risk factors for glucose intolerance in Hepatitis C patients; 2019.
- Yuksel M, Akturk H, Arıkan C. Immune monitoring of a child with autoimmune hepatitis and type 1 diabetes during COVID-19 infection. *European Journal of Gastroenterology & Hepatology*. 2020;32(9):1251-5.
- Wasuwanich P, Ingviya T, Thawillarp S, Teshale EH, Kamili S, Crino JP, et al. Hepatitis e-associated hospitalizations in the United States: 2010-2015 and 2015-2017. *Journal of viral hepatitis*; 2020.
- Kadla SA, Shah NA, Pathania R, Khan BA, Mir SA, Shah AI, Sheikh SA. Prevalence of diabetes mellitus in newly detected patients with hepatitis C. *Journal of Diabetology*. 2020;11(2):101.
- Jabeen R, Mobin A, Mehmood K, Ali ST. Frequency of pre-diabetes, diabetes mellitus in non-alcoholic fatty liver disease. *The Professional Medical Journal*. 2020; 27(08):1703-9.
- Hammerstad SS, Grock SF, Lee HJ, Hasham A, Sundaram N, Tomer Y. Diabetes and hepatitis C: A two-way association. *Frontiers in Endocrinology*. 2015;6:134.
- Ueyama M, Nishida N, Korenaga M, Korenaga K, Kumagai E, Yanai H, et al. The impact of PNPLA3 and JAZF1 on hepatocellular carcinoma in non-viral hepatitis patients with type 2 diabetes

- mellitus. Journal of gastroenterology. 2016;51(4):370-9.
12. Naing C, Mak JW, Ahmed SI, Maung M. Relationship between hepatitis C virus infection and type 2 diabetes mellitus: meta-analysis. World journal of gastroenterology: WJG. 2012;18(14): 1642.
 13. Memon MS, Arain ZI, Naz F, Zaki M, Kumar S, Burney AA. Prevalence of type 2 diabetes mellitus in Hepatitis C virus infected population: a Southeast Asian study. Journal of diabetes research; 2013.
 14. Singh KK, Panda SK, Acharya SK. Patients with diabetes mellitus are prone to develop severe hepatitis and liver failure due to hepatitis virus infection. Journal of Clinical and Experimental hepatology. 2013;3(4):275-80.
 15. Mansoor S, Bhutta S. Prevalence of diabetes in patients with HCV hepatitis and cirrhosis. Annals of Pakistan Institute of Medical Sciences. 2013;9(4):172-5.
 16. Fabrizi F, Dixit V, Messa P. Hepatitis C virus and mortality among patients on dialysis: A systematic review and meta-analysis. Clinics and research in hepatology and gastroenterology. 2019;43 (3):244-54.
 17. Ferreira VS, Pernambuco RB, Lopes EP, Morais CN, Rodrigues MC, Arruda MJ, Vilar L. Frequency and risk factors associated with non-alcoholic fatty liver disease in patients with type 2 diabetes mellitus. Arquivos Brasileiros de Endocrinologia & Metabologia. 2010;54 (4):362-8.
 18. Atif M, Arshad S, Javaid K, ul Hassan M, Ahmad F, Imran M, et al. Diabetes and Hepatitis C: Two sides of a coin. Advancements in Life Sciences. 2017; 4(3):72-6.
 19. Ghouri A, Kumar S, Khan SA, Ghani MH, Aslam S. Frequency of type 2 diabetes mellitus in patients with chronic hepatitis C virus infection. JLUMHS. 2014;13(02):51.
 20. Sterling RK, Wright EC, Morgan TR, Seeff LB, Hoefs JC, Di Bisceglie AM, Dienstag JL, Lok AS, HALT-C Trial Group. Frequency of elevated hepatocellular carcinoma (HCC) biomarkers in patients with advanced hepatitis C. The American Journal of Gastroenterology. 2012;107 (1):64.

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