Original Article

Comparison of Outcome of Acute Viral Hepatitis between Diabetic and Non-diabetic Patients: A Tertiary Care Hospital Experience

Hossain RMM[a], Rahman MA[b],Azam MG[c], Bhuiyan TM[d], Mir AS[e], Datta IK[c], Al-Mamoon MA[f]

Abstract

Background: *Diabetes and its complications are major causes of morbidity and mortality throughout the world. It has been observedthatpatients who develop prolonged orcomplicated course of acute viral hepatitis (AVH) often have underlying diabetes.This study was designed to compare the outcome of AVH between type 2 diabetic and non-diabetic patients.*

Methods: *This prospective observational studywas done in BIRDEM General Hospital from July 2011 to December 2013.A total of 60 patients suffering fromAVH admitted in Gastrointestinal, Hepatobiliary and Pancreatic Disorders (GHPD) Department were included. Of them 30 patients were diabetic (group A) and 30 patients were non-diabetic (group B). Patients'clinicaland biochemical parameters were evaluated during hospital stay.*

Results: *Aetiology of AVH were hepatitis E (76.67%), hepatitis B (16.67%) and hepatitis A (6.67%). Among two groups(group A vs group B respectively); age in years (mean±SD) was 47.8±10.8 vs 30.7±11.0,gender distribution was (M/F) 18/12 vs 25/5; serum bilirubin (mean±SEM) 15.6±6.2 mg/dl vs9.8±5.5 mg/dl (p=0.001), serum ALT (mean±SEM) 735.5±92.2 iu/L vs 1491.3±189.0 iu/L, (p=0.01) and serum AST (mean±SEM) 567.9±66.9 iu/L vs 1024.8±209.2 iu/L (p=0.036). Mean duration of hospital stay in days was 17.9±8.2 vs 11.0±5.1(p<0.001) in group A and group B respectively. Sub-acute hepatic failure developed in 5(16.6%) cases of group A andonly 1(3.3%) case in group B. Three (10%) cases of group A developed acute pancreatitis who recovered with conservative treatment. No case of mortality was observed during the follow-up period.*

Conclusion: *Complications of AVH in diabetic patients were more than non-diabetics. Rational and appropriatemanagement in diabetic patients may reduce the morbidity and mortality rate.*

Key words: *acute viral hepatitis, diabetes mellitus, outcome.*

(BIRDEM Med J 2019; 9(1): 14-17)

Author Information

a. Dr. Riad Md Moshaed Hossain, Senior Medical Officer, Department of Gastrointestinal, Hepatobiliary and Pancreatic disorders (GHPD), BIRDEM General Hospital, Dhaka
b. Prof. Md. Anisur Rahman, Professor, Department of Gastrointestinal, Hepatobiliary and Pancreatic disorders (GHPD), BIRDEM General Hospital, Dhaka
c. Dr. Mohammad Golam Azam, Associate Professor; Dr. Indrajit Kumar Datta, Associate Professor, Department of Gastrointestinal, Hepatobiliary and Pancreatic disorders (GHPD), BIRDEM General Hospital, Dhaka
d. Prof. Tareq Mahmud Bhuiyan, Professor, Department of Gastrointestinal, Hepatobiliary and Pancreatic disorders (GHPD), BIRDEM General Hospital, Dhaka.
e. Dr. Ahmed Salam Mir, Assistant Professor, Department of Endocrinology, Dhaka Central International Medical College, Dhaka.
f. Dr. Md. Abdullah Al Mamoon, Junior Consultant, Department of Gastrointestinal, Hepatobiliary and Pancreatic disorders (GHPD), BIRDEM General Hospital, Dhaka, Bangladesh.

Address of Correspondence: Dr. Riad Md Moshaed Hossain, Senior Medical Officer, Department of Gastrointestinal, Hepatobiliary and Pancreatic disorders (GHPD), BIRDEM General Hospital, Dhaka, Bangladesh. E-mail: drhossain1977@gmail.com

Received: May 10, 2018 **Accepted:** October 31, 2018

Introduction

Acute viral hepatitis (AVH) is a systemic infection affecting predominantlythe liver. It is usually a self-limited disease characterized by typical course of prodrome followed by an icteric phase. It carries low mortality. Hepatitis E virus (HEV) has been demonstrated as the most common cause of acute hepatitis in the Indian subcontinent.[1]

In some cases the course may be complicated by the development of cholestatic phase and in some cases sub-acute or acute liver failure (ALF). The development of complicated course depends on a number of factors such as the type of virus and a variety of host factors including age, immune status of the host and condition of the underlying liver before the onset of hepatitis.[2]

The natural history of viral hepatitis in patients with diabetes is not well described. Patients with diabetes

often have prolonged or complicated course of AVH.

Diabetes is a systemic disease and its complications are major cause of mortality and morbidity.[3] Hepatic fat accumulation is a well-recognized complication of diabetes with a reported frequency of 40–70%. Unfortunately, associated obesity is a frequently occurring confounding variable. Fat is stored in the form of triglyceride and may be a manifestation of increased fat transport to the liver and decreased oxidation or removal of fat from the liver. Liver regeneration capacity has been demonstrated to be impaired among animal and human with fatty liver after partial resection. It is therefore that diabetic patients having non-alcoholic fatty liver disease (NAFLD) may have poor regenerating capacity leading to prolonged course of hepatitis.[4]

This study was designed to compare the aetiological pattern, clinical and biochemical picture and the outcome of AVH in diabetic and non-diabetic patients.

Methods

This was a prospective observational study carried at Gastroenterology Department of BIRDEM Hospital from July 2011 to December 2013. A total of 60 patients diagnosed as AVH wereincluded in this study. Of them 30 patients was diabetic 30 non-diabetic. Known chronic liver disease cases, patients with haemolytic anaemia, malaria, leptospirosis andsepticemia were excluded. Patients with history of recent intake of drugs known to cause acute hepatitis, history of alcohol ingestion >40mg/day, suspected ischemic hepatitis and pregnancy were also excluded.

Bedside interview was taken after admission by using a semi-structured questionnaire containing information regarding history, clinical examination and relevant investigation reports.The subsequent investigation reports were recorded during hospital course.

Each patient's serum wastested for HBsAg, IgM anti-HBc, IgM anti-HEV and IgM anti-HAV. The method employed for HBsAg, IgM anti-HBc, IgM anti-HAV were chemiluminescence immunoassay (CMIA) in Architect plus platform of Abott USA. IgM anti-HEV was done by using ELISA from JAJ International Inc, USA following manufacturer's instruction.

Results

A total of 60 patients suffering from AVH were included in this study. Of them 30 patients were diabetic (Group-A) and 30 were non-diabetic (Group-B). Among 60 patients, 43 (83.3%) were male, eighteenmale patients were in Group-A and 25 were in Group-B. Diabetic patients were significantly older and had significantly higher BMI(Table I).

Table I Baseline characteristics of study population (n=60)

Variable	Diabetic (n=30)	Non-diabetic (n=30)	P value
Age (years)	47.8±10.80	30.7±11.00	<0.0001
Male sex: n(%)	18 (60)	25 (83.3)	0.048
Body mass index (kg/m)	26.87±3.20	19.80±2.79	<0.0001

All patients presented with prodromal features and jaundice. Leg swelling was more commonin diabetic group and tender liver in non-diabetic group (Table II).

Table II Clinical parameters (n=60)

Parameter	Group			
	Diabetic (n=30)		Non-diabetic (n=30)	
	n	%	n	%
Tender liver	9	30.0	17	56.0
Leg oedema	7	23.3	1	3.33
Shifting dullness	5	16.67	1	3.33
Flapping tremor	1	3.33	0	0.0

Biochemical parameters showed complicated course in diabetic patients than non-diabetic patients (Figures 1 &2). The meanalanine aminotransferase (ALT) and albumin valueswere significantly low and mean bilirubin value was significantly high in diabetic group than non-diabetic group (Table III).

Hepatitis E virus was the commonest cause (76.67%) of AVH and second common cause was hepatitis B virus (16.67%). Acute B virus hepatitis was more common in non-diabetic group. (Table IV)

Total 5 patientsdeveloped sub-acute hepatic failure. Frequency of hepatic failure in diabetic patients was 16.67% (13.34% caused by HEV and 3.34% by HBV) and in non-diabetic group 3.33% (caused by HEV).Another rare complication e.g. acute pancreatitis (10%)also observed in diabetic patients (Table V).

Patients included in this study were observed during their hospital course. The mean duration of hospital stay in diabetic patients was significantly high than non-diabetic patients (Figure 3).

Table III Biochemical parameters (n=60)

Subject	Number	Mean±SD	P-value	
ALT U/L	Diabetic	30	735.50±92.2	0.001
	Non-diabetic	30	1491.33±189.0	
AST U/L	Diabetic	30	567.93±66.9	0.036
	Non-diabetic	30	1024.89±209.2	
Billirubin mg/dl	Diabetic	30	15.642±6.295	0.004
	Non-diabetic	30	9.823±5.581	
Alkaline phosphatase U/L	Diabetic	30	219.83±83.79	0.355
	Non-diabetic	30	201.21±70.35	
S. total protein gm/L	Diabetic	30	69.33±12.67	0.957
	Non-diabetic	30	69.48±8.75	
S. albumin gm/L	Diabetic	30	30.16±7.91	0.0016
	Non-diabetic	30	36.19±6.03	
Prothrombin time (Seconds)	Diabetic	30	7.65±1.40	0.542
	Non-diabetic	30	4.80±0.88	

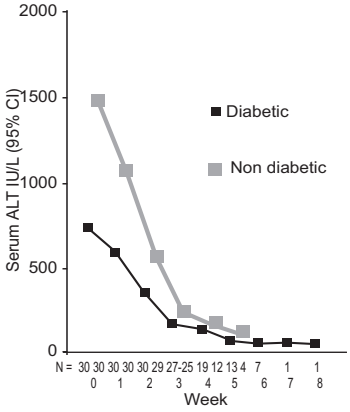

Figure 1 Temporal profile of serum ALT level in the study subjects (N=60)

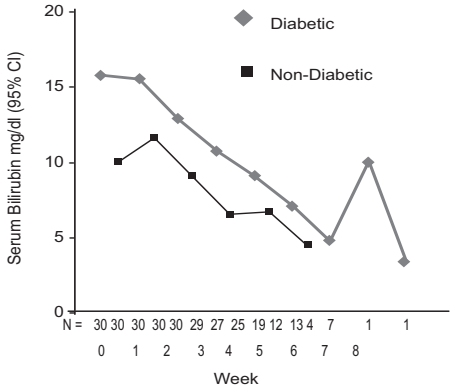

Figure 2 Temporal profile of serum bilirubin level in the study subjects (N=60)

Table IV Virological etiology

Viruses	Diabetic (n=30)		Non-diabetic (n=30)		Total
	n	%	n	%	%
HEV	26	86.67	20	66.67	76.67
HBV	3	10.0	7	23.33	16.67
HAV	1	3.34	3	10.0	6.67

Table V Complications (N=60)

Subject	Viruses	Group			
		Diabetic (n=30)		Non-diabetic (n=30)	
		Number	Percentage	Number	Percentage
Subacute hepatic failure	HEV	4	13.34	1	3.34
	HBV	1	3.34	0	
	Total	5	16.67	1	3.34
Pancreatitis	HEV	3	10.00	0	0

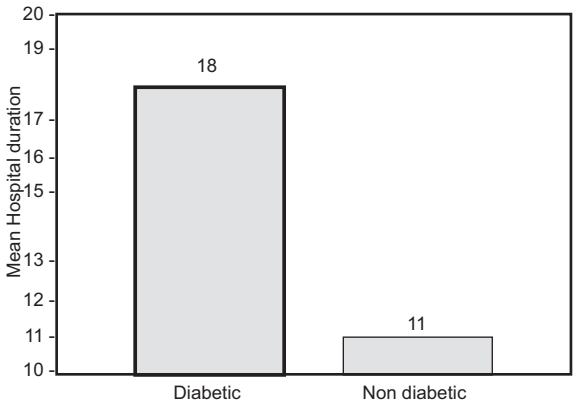

Figure 3 Duration of hospital stay (N=60)

Discussion

Usually the natural course of AVH is complete spontaneous clinical, biochemical and virological recovery within 4–6 weeks. But previous study showedcomplications develop in about 1–5% of patients like acute liver failure (ALF), subacute hepatic failure or prolonged icteric course.[7]

This study revealed that diabetes is a risk factor for complicated outcome during an episode of AVH. In epidemic and sporadic situations, the frequency of ALF in AVH has been reported in 1–2% of the patients.[2] A frequency of more than 16% hepatic failure among diabetics with AVH is alarming and identifies diabetes as a risk group to develop liver failure subsequent to AVH. Overall patients with diabetes had prolonged icteric phase with significantly prolonged hospital stay. It is however uncertain whether it is diabetes per se or medications for diabetes or some unknown factors that account for the increased risk of ALF in diabetes mellitus.[6]

Another observation is the more frequency of HBV associated AVH among non-diabetics was more common than diabetics. This data would indicate that young non-diabetics are more prone to develop acute hepatitis B virus infection. These finding would logically suggest inclusion of young adults as routine candidates for HBV vaccination.

Conclusion

The current study shows that diabetic patients with AVH had lower serum ALT, higher serum bilirubin levels, more chance of developing hepatic failure and increased length of hospital stay compared to non-diabetics.Further large scale prospective studiesare required to confirm our findings and to explore the underlying cause of the poor outcome in patients of DM with AVH.

Conflict of interest: Nothing to declare.

References

1. Das K, Agarwal A, Andrew R, Frosner GG, Kar P. Role of hepatitis E and other hepatotropic virus in aetiology of sporadic acute viral hepatitis: A hospital based study from urban Delhi. Eur J Epidemiol 2000; 16(10): 937-40.
2. Krawczynski K. Hepatitis E. Hepatology 1993; 17:932.
3. American Diabetes Association. Standards of Medical Care in Diabetes 2017. Diabetes Care 2017; 40(Suppl. 1):S1–S2.
4. Lambert P. What is Type 1 Diabetes? Medicine 2002; 30: 1–5.
5. Rashid MHO. Outcome of Acute Viral Hepatitis in Diabetic and Non Diabetic Patients in Bangladesh-Report From a Tertiary Centre. Journal of Clinical and Experimental Hepatology 2017; 7 (Suppl 2): S21 - S22.
6. Tolman KG, Fonseca V, Dalpiaz A, Tan MH. Spectrum of Liver Disease in Type 2 Diabetes and Management of Patients With Diabetes and Liver Disease. Diabetes Care 2007; 30(3): 734-43.
7. O'Grady JG, Alexander GJM, Hayllar KM, Williams R. Early indicatorsof prognosis in fulminant hepatic failure. Gastroenterology1989;97:439–45.
8. Acharya SK, Dasarathy S, Kumer TL, Sushma S, Prasanna KS, Tandon A, et al. Fulminant hepatitis in atropical population: clinical course, cause and early predictors ofoutcome. Hepatology. 1996;23:1448–55.