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Analysis of clinical, histological and biochemical findings in patients with alcoholic steatohepatitis and non-alcoholic steatohepatitis

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Abstract

Background: Spectrum of alcoholic liver disease ranges from steatosis to steatohepatitis (alcoholic steatohepatitis) to cirrhosis. The present study was conducted to study the similarities and differences in biochemical and histologic features between NASH and ASH.

Materials & Methods: It included 40 patients of ASH and 40 patients of NASH. The morphologic criteria for including cases in ASH and NASH were degree of steatosis, ballooning, portal and lobular inflammation with or without fibrosis. Clinical, biochemical and histological features were compared in both groups.

Results: Bilirubin level in ASH patients was 5.46 mg% and in NASH group was 2.37 mg%. The difference was significant ($P < 0.05$). AST level in ASH group was 90.4 IU/ml and 72.2 IU/ml in NASH group. ALT was significantly higher in NASH group as compared to ASH group (104.6 IU/ml vs 76.8 IU/ml). SAP level was also significantly higher in NASH group as compared to ASH group (202.7 IU/ml vs 116 IU/ml). Comparison of steatosis, ballooning, portal inflammation, lobular inflammation and fibrosis revealed significant ($P < 0.05$) difference in both groups.

Conclusion: Alcoholic steatohepatitis (ASH) and non-alcoholic steatohepatitis (NASH) are two forms of liver diseases. AST, ALT, SAP and bilirubin level helps in diagnosis the cases. Histologic features such as steatosis, ballooning, lobular inflammation, portal inflammation and fibrosis are other differentiating features in both diseases.

Keywords: alcoholic steatohepatitis, non-alcoholic steatohepatitis, steatosis

Introduction

Steatohepatitis is a type of fatty liver disease, characterized by inflammation of the liver with concurrent fat accumulation in liver. Mere deposition of fat in the liver is termed steatosis, and together these constitute fatty liver changes^[1].

There are two main types of fatty liver disease: alcohol-related fatty liver disease and non-alcoholic fatty liver disease (NAFLD). Risk factors for NAFLD include diabetes, obesity and metabolic syndrome. When inflammation is present it is referred to as alcoholic steatohepatitis (ASH) and nonalcoholic steatohepatitis (NASH). Steatohepatitis of either cause may progress to cirrhosis, and NASH is now believed to be a frequent cause of unexplained cirrhosis (at least in Western societies). NASH is also associated with lysosomal acid lipase deficiency^[2].

Spectrum of alcoholic liver disease ranges from steatosis to steatohepatitis (alcoholic steatohepatitis) to cirrhosis. Steatosis, ballooning degeneration of hepatocytes and lobular inflammation, either mixed type or with a predominance of neutrophilic polymorphs, with or without fibrosis are the most common histologic features seen in alcoholic liver disease.

The histologic features characteristic of steatohepatitis in the absence of significant alcohol consumption can be seen in a wide variety of conditions like drugs and toxins exposure, Wilson's disease Indian childhood cirrhosis, jejunio-ileal bypass, obesity surgery and acquired insulin resistance (metabolic syndrome)^[3].

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The last entity i.e. acquired insulin resistance syndrome (metabolic syndrome) is regarded the most important causal factor for 'non-alcoholic steatohepatitis' or 'idiopathic' non-alcoholic steatohepatitis (NASH). Histologic features most commonly found in NASH are steatosis, ballooning degeneration of hepatocytes and lobular inflammation with or without fibrosis. NASH is a histologic diagnosis and can be diagnosed only on liver biopsy [4]. The present study was conducted to study the similarities and differences in biochemical and histologic features between NASH and ASH.

Materials & Methods

The present study was conducted in the department of general pathology. It included 40 patients of ASH and 40 patients of NASH. All were informed regarding the study and written consent was obtained.

Inclusion criteria in the alcoholic liver disease group were - confirmed and continuous use of significant amount of alcohol, defined as > 80 gm per day for the last five years and abnormal serum transaminases with or without clinical evidence of alcoholic liver disease like jaundice, hepatomegaly, ascitis, esophageal varices, spider nevi and palmar erythema. The morphologic criteria for including cases as alcoholic steatohepatitis were steatosis or lobular inflammation either mixed or comprising predominantly of polymorphs with or without fibrosis. Exclusion criteria included concurrent viral infection, concurrent medications such as high dose estrogens, corticosteroides, and amiodarone in the last six months or other co-morbid condition.

Inclusion criteria for NASH group was elevated serum transaminases, no history of alcohol intake (alcohol intake < 20 gm/day) and presence of fatty liver on USG/MRI. The morphologic criteria for including cases were the same as those given by Matteoneoi *et al.* for classifying liver biopsy as NASH i.e. presence of any degree of steatosis, ballooning and lobular inflammation with or without fibrosis. Exclusion criteria included concurrent viral infection, autoimmune hepatitis, hemochromatosis, Wilson's disease, overt diabetes at first presentation, concurrent systemic illness and concurrent medications such as high dose estrogens, corticosteroides, and amiodarone in the last six months.

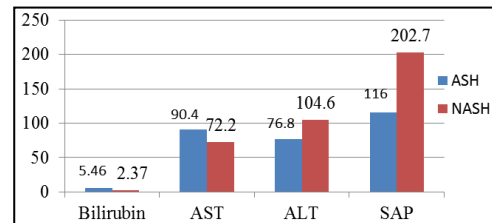
Clinical, biochemical and histological features were compared in both groups. Results were tabulated and subjected to statistical analysis. P value <0.05 was considered significant.

Results

Table I: Distribution of patients

Total - 80		
ASH	NASH	P value
40	40	1

Table I shows that out of 80 patients, 40 were each in ASH group and NASH group. The difference was non- significant (P>0.05).



Graph I: Comparison of biochemical findings

Graph I shows bilirubin level in AST patients was 5.46 mg% and in NASH group was 2.37 mg%. The difference was significant (P<0.05). AST level in ASH group was 90.4 IU/ml and 72.2 IU/ml in NASH group. ALT was significantly higher in NASH group as compared to ASH group (104.6 IU/ml vs 76.8 IU/ml). SAP level was also significantly higher in NASH group as compared to ASH group (202.7 IU/ml vs 116 IU/ml).

Table II: Comparison of histologic features in both groups

Histologic features	ASH	NASH	P value
Steatosis			
0	10	4	0.02
1+	20	4	
2+	4	10	
3+	6	22	
Ballooning			
1+	12	34	0.01
2+	28	16	
Lobar inflammation			
0	1	4	0.001
1+	15	20	
2+	22	14	
3+	2	3	
Portal inflammation			
0	6	3	0.01
1+	15	20	
2+	14	15	
3+	5	2	
Fibrosis			
0	3	9	0.05
1+	12	16	
2+	18	12	
3+	4	2	
4+	3	1	

Table II shows that steatosis in ASH group was 0 in 10 patients, 1+ in 20 patients, 2+ in 4 patients and 3+ in 6 patients and in NASH group was 0 in 4 patients, 1+ in 4 patients, 2+ in 10 patients and 3+ in 22 patients. The difference was significant (P<0.05). Ballooning was 1+ (ASH- 12, NASH- 34), 2+ (ASH-28, NASH-16). Lobar inflammation was 0 (ASH- 1, NASH-4), 1+ (ASH- 15, NASH- 20), 2+ (ASH- 22, NASH- 14), 3+ (ASH- 2, NASH- 3). Portal inflammation was 0 (ASH- 6, NASH- 3), 1+ (ASH- 15, NASH- 20), 2+ (ASH- 14, NASH- 15), 3+ (ASH- 5, NASH- 2). Fibrosis was 0 (ASH- 3, NASH- 9), 1+ (ASH- 12, NASH- 16), 2+ (ASH- 18, NASH- 12), 3+ (ASH- 4, NASH- 2), 4+ (ASH- 3, NASH- 1). The difference was significant (P<0.05).

Discussion

Chronic alcohol intake commonly causes steatohepatitis. Non-alcoholic steatohepatitis is fatty liver disease due to causes other than alcohol. No pharmacological treatment has received approval as of 2015 for NASH. Some studies suggest diet, exercise, and antiglycemic drugs may alter the course of the disease. General recommendations include improving metabolic risk factors and reducing alcohol intake. NASH was first described in 1980 in a series of patients of the Mayo Clinic. Its relevance and high prevalence were recognized mainly in the 1990s. Some think NASH is a diagnosis of exclusion, and many cases may in fact be due to other causes^[5]. The present study was conducted to study the similarities and differences in biochemical and histologic features between NASH and ASH.

In this study, out of 80 patients, 40 were each in ASH group and NASH group. Our study shows significantly higher bilirubin level in AST patients (5.46 mg% vs 2.37 mg%). AST level in both groups were comparable. ALT was significantly higher in NASH group as compared to ASH group (104.6 IU/ml vs 76.8 IU/ml). SAP level was also significantly higher in NASH group as compared to ASH group (202.7 IU/ml vs 116 IU/ml). This is in agreement with Lelback^[6].

We observed steatosis, ballooning, lobular inflammation, portal inflammation and fibrosis in ASH and NASH groups. Steatosis was either 0, 1+, 2+ and 3+ depending upon area involved. Ballooning was 1+ (few cells), 2+ (many cells). Lobular inflammation and portal inflammation as 0, 1+, 2+ and 3+ depending upon portal tract involved. We found that difference was significant in both groups. This is in agreement with Carson^[7].

Both ASH and NASH are significant forms of liver disease and may progress to end-stage liver disease, cirrhosis, and its attendant physiologic, metabolic, and potentially malignant complications. Hepatocellular carcinoma is a recognized complication of both entities. Both diseases may necessitate liver transplantation, and have been reported to recur in the allograft livers^[8].

The most difficult aspect of establishing a diagnosis of NASH is distinguishing it from ASH. Correct diagnosis of NASH versus ASH is necessary as it has important therapeutic and prognostic implications for the patient. Studies show that laboratory markers such as AST, ALT and GGT lack sufficient sensitivity and specificity to diagnose chronic excessive alcohol consumption^[9, 10].

Conclusion

Alcoholic steatohepatitis (ASH) and non-alcoholic steatohepatitis (NASH) are two forms of liver diseases. AST, ALT, SAP and bilirubin level helps in diagnosis the cases. Histologic features such as steatosis, ballooning, lobular inflammation, portal inflammation and fibrosis are other differentiating features in both diseases.

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