

Fatty liver disease in Sudan is not alcohol related

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Abstract:

Background: The finding of fatty liver disease (FLD) has generally been assumed to be a consequence of ethanol ingestion. However, non-alcoholic fatty liver disease (NAFLD) was identified as a specific entity. Although FLD is generally nonprogressive or only slowly progressive, cirrhosis and HCC can develop.

Objectives: The aim of this study is to find out the prevalence, clinical presentation and aetiology of FLD in Sudanese patients.

Methods: This is a descriptive cross sectional study which included 100 patients with FLD detected by ultrasonography at the national center for gastro-intestinal and liver diseases. Data was collected using a well designed questionnaire and results were analyzed by using SPSS computer system.

Results: Out of 1800 patients with liver disease, 100 were found to have FLD. These have no sex difference. Their mean age was 49.8 ± 15.2 years. The main presenting symptoms were upper abdominal pain (60%) and fatigability in (41%), while (7%) were asymptomatic. Hepatomegaly was clinically detected in (44%). Ninety out of these 100 patients had non alcoholic fatty liver disease (NAFLD). In this group (42%) were diabetics and (55%) had hyperlipidemia. A BMI of $> 25\text{kg/m}^2$ was detected in 47% of patients. In patients with FLD and a BMI $< 18\text{kg/m}^2$ underlying diagnoses were made. Six patients had liver biopsy only two of them proved to have NASH.

Conclusion: Fatty liver disease is not uncommon in Sudan and most of the patients' diseases are non-alcohol related.



Introduction

Fatty liver disease (FLD) is a chronic disease that affects a high proportion of the world's population. The finding of fatty liver has generally been assumed to be a consequence of ethanol ingestion. However, fatty liver can be due to metabolic diseases, medications and nutritional disorders. NAFLD was originally identified in morbidly obese individuals, especially after weight reduction surgery, and in diabetic women. It is now known that NAFLD also occurs in individuals who are not diabetics¹. It comprises a wide spectrum of liver damage ranging from simple, uncomplicated steatosis to advanced fibrosis and cirrhosis. Based on the morphologic pattern of liver injury in 20 patients evaluated at the Mayo Clinic over a 10-year period, Ludwig *et al.*² proposed a classification scheme for steatohepatitis that recognized the existence of a previously undescribed entity-non-alcoholic steatohepatitis (NASH)-, that was histologically identical to alcoholic hepatitis but had a different epidemiologic and clinical profile.

Non-alcoholic steatohepatitis (NASH) represents a stage within the spectrum of NAFLD and is defined histologically by the presence of fatty liver along with necroinflammatory activity mostly of lobular distribution³.

The clinical implications of FLD are derived mostly from its common occurrence in the general population as well as its potential to progress to cirrhosis and liver failure. Fatty liver is found in approximately one third of autopsies in previously healthy adults who died as a result of accidents elsewhere⁴.

Fatty liver is defined as an accumulation of lipid in the liver exceeding 5% of liver weight, or visualization of more than 5% of hepatocytes containing fatty droplets on light microscopy⁵.

Acute fatty liver of pregnancy is a separate entity which is not discussed here.

Objectives

To determine how common is fatty liver disease in Sudanese patients, to study the etiology, the subtypes and presentation of this disease in Sudanese patients.

Patients and methods

This is a descriptive cross sectional study in Sudanese patients with FLD. It was done at the National Centre of Gastrointestinal and Liver Diseases at Ibn Sina Hospital Khartoum, Sudan. Out of 1800 patients who had ultrasonography for different liver diseases over a period of two years from Jan 2002 through Dec 2004, 100 cases were found to have FLD.

Data of these patients was collected by a questionnaire and retrieving information from the

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patients' files. This was constructed in sections to address the different aspects of the study as follows: Personal data, presentation, physical examination and investigations including liver function tests, full blood count, mean corpuscular volume, lipid profiles and fasting blood sugar. The entire sample had an abdominal ultrasound examination by one radiologist. Liver biopsy and CT abdomen were done when indicated

Data analysis: All the collected data was entered in a master sheet and fed to a statistical package for social sciences (SPSS Illinois Chicago)

Results:

Distribution of FLD to the subclasses: AFLD, Primary and Secondary NAFLD with their age distribution and BMI were shown in (table 1). Fifty- Five (55%) patients were female with male to female ratio of 1:1.2 while the ratio is 1: 3 and 1: 1 in primary and secondary NAFLD respectively.

Ninety (90 %) patients denied alcohol abuse. Presenting symptoms and signs were shown in (Fig 1). Hepatomegaly was clinically detected in 44(44%) patients. Patients with primary NAFLD presented with right hypochondrial discomfort (75.6%), abdominal mass (31.7%), fatigability (29.2) while 14.6% were asymptomatic.

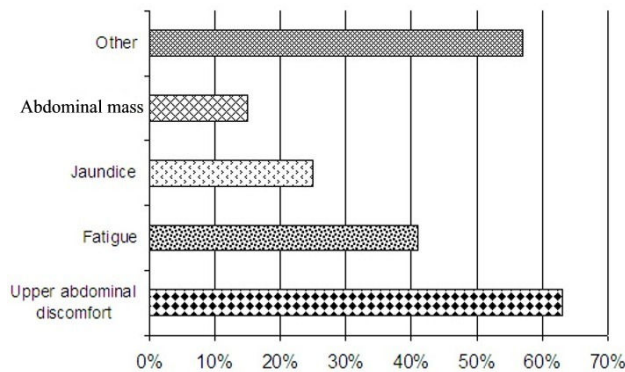


Fig1.Presenting symptoms in patients with FLD (n=100).

In patients with FLD and BMI < 18 Kg/ m2 other diagnoses were made (Table2). Liver function tests were performed for all patients.

In AFLD group all the 10 patients were males with mean age of 44.4±8.5. AST/ ALT > 1 was detected in 6(60%), MCV > 100 FL in 5(50%) patients. In NAFLD group (61%) were female with male to female ratio of I: 1.6. AST / ALT < 1 was found in (67.7%).

Forty three (46.6%) of NAFLD group had primary NAFLD, 46 (51%) presented with secondary NAFLD, while one patient had no risk factor.

Table2: underlying diagnoses in patients with BMI< 18kgs/m2 (n = 26)

Diagnosis	No	%
GI malignancy	11	42.3
HIV	3	11.5
TB	5	19.2
Malabsorption	4	15.4
IBD	3	11.5

Risk factor for primary NAFLD were BMI > 25 Kg/m2 in (80%), NIDDM in (42.2%), Hyperlipidemia in (55%), Hypertention in (25%) and (62.8%) had more than 2 risk factors. Underlying diagnoses in patients with secondary NAFLD are shown in (Fig. 2).

Thirty seven (37%) patients with FLD had gallstones on the ultrasound.

In six patients liver biopsy was done as part of their work up, four had secondary FLD, two patients had primary NAFL, both of these two were overweight, had hepatomegaly, normal liver function tests, and they were not diabetic. One of them had hyperlipidemia in which liver biopsy confirmed NASH.

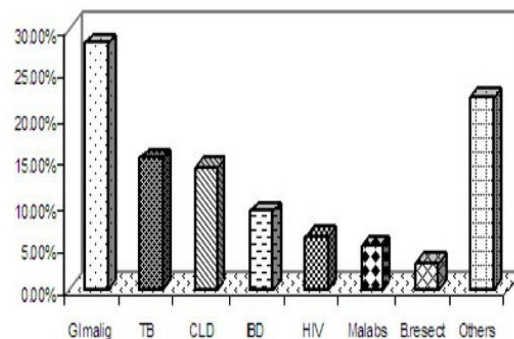


Fig 2. Secondary causes of NAFLD (n=46).

Discussion:

Fatty infiltration of the liver can be detected by ultrasonography or CT scan⁶. Because the fat

Table 1. Age, Sex, BMI of different groups of liver disease

Age	FLD	AFLD		Prim. NAFLD		Seco. NAFLD	
		M	F	M	F	M	F
1-19	2	0	0	0	0	2	0
20-39	24	4	0	2	6	6	6
40-59	33	5	0	2	14	6	6
60-79	37	1	0	14	6	5	11
>80	4	0	0	0	0	4	0
Age Mean \pm SD	-	44.4 \pm 8.5		53.14 \pm 14		47.8 \pm 24	
Mean of BMI	-	20		28		18.9	
Total No	100	10	0	18	26	23	23

Table 3. Comparison of studies of patients with NAFLD

Author	n	Age (Years)	Female (%)	Diabetes (%)	Obesity (%)	Hyperlipidemia (%)
Bacon ⁽¹⁾	33	47	42	21	39	21
Ludwig ⁽²⁾	20	54	65	50	90	67
Lee ⁽¹⁰⁾	49	53	78	51	69	NR
Matteoni ⁽¹¹⁾	132	53	53	33	70	92
Angulo ⁽¹²⁾	144	51	67	28	60	27
Diel ⁽¹³⁾	49	52	81	55	71	20
Powel ⁽¹⁴⁾	42	49	83	36	95	81

distribution in the liver is uneven, the sensitivity of these imaging techniques for fatty infiltration is only 60%^{7,8}. However, this sensitivity may rise up to 80 to 90% when more than half the hepatocytes in an imaged region have macrovesicular fatty infiltration. Magnetic resonance imaging (MRI) using conventional spin-echo (SE) pulse sequences is relatively insensitive⁹.

To our knowledge, this is first study of FLD using ultrasonography done in Sudan.

The majority of patients with fatty liver are asymptomatic¹⁰. Some patients may come for evaluation of hepatomegaly, others present with mild abnormalities of the serum aminotransferases and alkaline phosphatase detected on routine visits to their physicians or detected incidentally by sonograms and/or a computed tomography (CT) scan performed to investigate other conditions. Fatty liver, however, can present with non-specific abdominal discomfort. In addition, patients with fatty liver of different etiologies will have systemic symptoms and signs related to their underlying disorders: in our patients the presenting symptom were more or less in accordance with that reported by Matteoni¹¹.

The commonest underlying risk factors for FLD in the study population were similar to those reported earlier^{1,2,10-14} (Table.3).

Our study showed that gallstones are common with primary NAFLD, this may be an incidental finding due to the shared predisposing risk factors.

In secondary NAFLD group the mean age, male to female ratio and the underlying etiological causes were more or less in accordance with EL-Hassan⁵ et al. Hematological and non-hematological malignancies with or without liver involvement were the most frequently encountered etiological factors in (66%) of patients.

Liver biopsy is indicated in patients with enzyme elevations for more than 6 months duration, and changes in other liver tests, particularly if the symptoms and liver test worsen¹⁵. In addition, liver biopsy is indicated when there is doubt in the diagnosis or cause of the fatty liver¹². Only six of our patients fulfilled the pre-requisite criteria for liver biopsy. Out of these two had primary NAFLD. The biopsy confirmed NASH in only one patient with presentation similar to that reported by Ludwig in 1980. NASH is diagnosed in 7 to 9 percent in Western countries and 1.2 percent in Japan²¹⁶. This small number of biopsies might have underestimated NASH in our study. However,

because liver biopsies are not without morbidities, we opted to proceed for it only once there was strong indication.

Laboratory abnormalities in patients with FLD are usually minimal. The most common ones are mild elevation of the serum aminotransferases, alkaline phosphatase, or gamma glutamyl transpeptidase².

The number in AFLD group was small. This is probably due to the fact that alcohol consumption had been markedly decreased in the last 20 years in concordance with the governmental legislations. In addition, the Sudanese females do not usually consume alcohol as a habit.

Overlapping of this group with groups of primary and secondary NAFLD was seen in four and two patients respectively. Distinguishing these was made only by history because alcohol markers in our study showed only sensitivity of 50-60% in accordance with the literature¹⁷.

Conclusion

Fatty liver disease, as determined by ultrasound, is not uncommon in Sudanese patients and in most of the cases is non-alcohol related. Future work is required to define the pathogenesis of this condition and plan effective management.

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