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Research Article

Hepatic Steatosis in obese individuals undergoing bariatric surgery

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Abstract

Background: Metabolic-associated fatty liver disease **(**MAFLD) is now a leading cause of chronic liver disease worldwide**.** The global prevalence of MAFLD among obese individuals is 6.3–33%, increasing up to 75.8% and even surpassing 96%. Diagnosis of MAFLD depends on the presence of steatosis detected by liver biopsy or ultrasound. The aim of the study was to assess the prevalence of hepatic steatosis in obese patients before bariatric surgery in our locality. **Methods:** This is a cross-sectional study conducted in the endemic medicine department Minia university hospital in the period from May to December 2022. It included 49 patients (≥18 years) with BMI ≥ 25 undergoing bariatric surgery, where clinical examination, anthropometric measurements, biochemical tests, ultrasonography and liver biopsy were taken at the same day of operation. **Results:** The study included 8 males and 41 females, with the mean age of 38 years and a range from 18 to 59 years. the prevalence of steatosis by liver biopsy were 27 case (55.11%) while ultrasonography was 100% **Conclusion:** hepatic steatosis is a common finding in obese patients undergoing bariatric surgery and can be detected by abdominal ultrasonography and liver biopsy.

Keywords: obesity, statuses, fatty liver by ultrasound, metabolic associated fatty liver disease, liver biopsy.

Introduction

Recently, it has been proposed to change the name of non-alcoholic fatty liver disease (NAFLD) to Metabolic Associated Fatty Liver Disease (MAFLD) to better reflect the pathophysiology of the disease[(1).] MAFLD may better reflect the patho-physiology of this disorder and provides a broad definition for this heterogeneous disorder. The criteria are based on the evidence of hepatic steatosis, plus any of the following three conditions: overweight/ obesity, presence of type 2 diabetes mellitus (T2DM), or evidence of metabolic dysregulation[(1)]. The global prevalence of MAFLD among obese individuals is 6.3–33%, increasing up to 75.8% and even surpassing 96% in morbidly obese patients undergoing bariatric surgery [(2)] Key issues in patients with MAFLD are the differen-tiation of NASH from simple steatosis and identification of advanced hepatic fibrosis. Given the huge number of at-risk patients, there is a substantial unmet need for efficient and cost-effective means for risk stratification of MAFLD patients[(3).] Liver biopsy is the gold standard until now for the diagnosis of MAFLD[(3).] Recent studies showed beneficial effects on liver affection after bariatric surgery[(4),] an effective therapy should not only reduce steatosis and liver injury but also improve the metabolic sequelae and cardiovascular risk that is intimately linked to MAFLD.

Hence, lifestyle modification including dietary change, weight loss, and structured exercise intervention remains the first-line and cornerstone therapy for this condition. As it is currently the only effective treatment for morbidly obese patients. it was associated with rapid and long-lasting decrease in weight as well as a decrease in the rates of morbidity and mortality[5,6].

Furthermore, a decrease or a complete resolution of hepatic steatosis has been shown after bariatric surgery in 92% [7]. However little is known about the time course of these changes after surgery[8]. The aim of this study was to evaluate the prevalence of steatosis in patients undergoing bariatric surgery in our locality.

Patients and Methods

This study is an observational cross-sectional study, during the period from May to December 2022. This study included 49 patients evaluated for bariatric surgery from the attendee to the outpatient clinic of the Tropical Medicine Department at Minia university hospital in the period from May to December 2022 and referred for bariatric surgery after consent.

Inclusion Criteria:

Patients aged ≥18 years, BMI ≥25, patients undergoing bariatric surgery diagnosed by criteria of MAFLD, Both sex are included.

Data collection:

The socio-demographic data of the study subjects included age, gender, occupation, marital status and smoking. Detailed history, clinical examination, routine and specific laboratory investigations in addition to radiological assessment. A liver biopsy was done to determine the degree of steatosis and fibrosis in hepatic tissues. All these were done at the same day of operation.

Results

The study included 8 males and 41 females, with a mean age of 38 years and a range from 18 to 59 years. Age by mean±SD was 38±9.4 .as regard gender: males group were 8(16.3%) versus 41(38.7%) females. As regard occupation the most prevalent occupation was housewives 35(71.4%), manual workers 4(8.1%) and professional workers 10(20.4). The prevalence of smokers 2(4.1%) was lower than non-smoker 47(95.9%). The results are shown in table (1). The prevalence of steatosis by abdominal ultrasonography 100% (table 2) while by liver biopsy were 27case (55.11%) Table (3).

Table (1): Socio-demographic data of studied sample

Variables	Descriptive statistics	
Age	**Range= 18-59**	**Mean ±SD = 38.00±9.4**
Gender		
Females	41	83.7%
Males	8	16.3%
Occupation		
Not working	35	71.4%
Manual	4	8.1%
Professional	10	20.4%
Marital status		
Married	43	87.8%
Single	6	12.2%
Smoking		
No	47	95.9%
Yes	2	4.1%
Alcohol		
No	49	100%
Yes	0	0%

Quantitative data displayed as range, mean and standard deviation (SD), qualitative data displayed as number and %.

Table (2): Ultrasound findings of the studied sample

Variables	Number	Percent
Liver size		
Average	12	28.6%
Enlarged	30	71.4%
Surface:		
Fine irregular	1	2.4%
Smooth	41	97.6%
Echogenicity		
Bright granular	14	33.3%
Fatty	28	66.7%
Focal lesion		
No	42	100%
Yes	0	0%
IHBD		
No	42	100%
Yes	0	0%
PV		
Normal	42	100%
Abnormal	0	0%
CBD		
Normal	42	100%
Abnormal	0	0%
Spleen		
Enlarged	2	4.8%
Normal	40	95.2%
GB		
Normal	29	69%
Normal with multiple stones	5	11.9%
Normal with single stone	5	11.9%
Surgically removed	3	7.1%

Qualitative data displayed as number and %.

Table (3): Show Degree of steatosis by liver biopsy.

Degree of steatosis	Number	Percentage
A0	22	44.89%
A1	23	46.88%
A2	3	6.22%
A3	1	2.01%

Quantitative data displayed as number and %.

Discussion

Non-alcoholic fatty liver disease (NAFLD) is defined by macrovesicular steatosis in 5% hepatocytes, in the absence of a secondary cause such as alcohol or drugs. It includes a spectrum of diseases from non-alcoholic fatty liver (NAFL) through to non-alcoholic steatohepatitis (NASH), fibrosis and cirrhosis. The worldwide prevalence of NAFLD is about 25%, ranging from 13% in Africa to 23% in Europe and 32% in the Middle East[9]. Non-alcoholic fatty liver disease (NAFLD) is a recognized complication of obesity. [10] Recently, a consensus by an international panel of experts recommended a change in name for NAFLD to metabolic (dysfunction) associated fatty

liver disease (MAFLD)[1]. in our study, the number of cases was (49 cases) with 41 female (83.7%) and only 8 male (16.3%), no one of them was alcoholic, only 2 were smokers, 8 cases (16.3%) were diabetic and 10 cases (20.4%) were hypertensive. It was found that 27 cases (54%) had steatosis only by liver biopsy and 100% by ultrasound. Machado, M., et al., 2006 studied twelve observational and transversal studies,1620 patients with severe obesity were included, the prevalence of steatosis and NASH was 91% (range: 85–98%) and 37% (24–98%), respectively, with unexpected cirrhosis in 1.7% (1–7%). [10]

Conclusion

There is a very high prevalence of steatosis in asymptomatic morbidly obese patients.

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