Rate of Fatty Liver Disease in Najran Patients between 20-60 Years Old at King Khalid Hospital (Dec 2011-Dec 2012)

Maha Esmeal Ahmed, Najla Hussein Mohamed Khalid, Kholud Mohammed Mehdar

[1]Ph. D, Assistant Professor, Najran University- Kingdom of Saudia Arabia, Applied Medical College, Radiological Sciences Department

[2, 3]M.sc-Najran university-Applied Medical College-Radiological sciences

Abstract: ***The aim of this study is to evaluate the results of liver examination by ultrasound in Najran patients during the period Dec 2011- Dec 2012, specifically to discover the rate of incidence of fatty liver and its relationship to risk factors. This is a retrospective, descriptive and quantitative case series using data collected from King Khalid hospital in Najran during the period Dec 2011- Dec 2012, where 957 patients had undergone ultrasound examination for different abdominal diseases. Data of this study was collected using a check list from the PACS (picture archive and communicating system) and the results were analyzed by using SPSS computer system. Data for a total of 957 patients who had completed abdominal ultrasound were collected. 319 were found to have fatty liver as diagnosed by ultrasound. The mean age of the study group was (49.6 ± 14.1), the mean weight was (78± 6.12), and an elevated level of ALT (alanine aminotransferase), AST (aspartate aminotransferase) was detected in 55.7 % and 43.2% respectively . A BMI (Body mass index) > 25kg/m2 was detected in 80 % of the patient. The prevalence of NAFLD (non alcoholic fatty liver disease) was 33.3 % and it was more common in females (178, 55.4%) than in males (141, 44.1%). It is highest in the age group 40-60 years old. Diabetes was present in 24.1 % (77 patients with high fasting glucose), obesity in 45.7% (147 patients). Of the all patients, high cholesterol was present in 23, 7 % of the total. The prevalence of fatty liver in Najran patients is high. It is more common in the female than male. Obesity and diabetes are the common risk factors associated with fatty liver disease.***

Keywords: Fatty liver ultrasound Rate

1. Introduction

Hepatic steatosis or fatty liver is an infiltration of fat, mainly triglyceride, inside hepatocytes, usually exceeding 5% of the liver weight (1).Traditionally, fatty liver has been considered as a benign and reversible condition, usually the expression of a non- specific response of the liver (cause) metallic stress of different origin (2, 3).

Non-alcoholic fatty liver disease (NAFLD) is a clinical/biochemical condition characterized by fatty liver with or without necro-inflammation and fibrosis and is considered the hepatic expression of the metabolic syndrome (4).

NAFLD is now recognized as the most common liver disease in the United States, with a prevalence of approximately 5% in the general population and reaching 25 % to 75% in patients with obesity and type 2 diabetes mellitus. NAFLD is the most common liver disease in the Western industrialized countries. While it was assumed initially that obese women are particularly at risk for developing NASH (non-alcoholic steatohepatitis), it is well established nowadays that NASH may also occur in lean men and in children (5, 6).

Overweight and obesity are co-existing risk factors for fatty liver in Saudi Arabia and it is more prevalent in females. A prevalence of 7-10% has been reported in the general population of Saudi Arabia (7, 8).In Saudi Arabia, the prevalence of NAFLD as evaluated by computed tomography is about 10%(6).The prevalence of overweight and obesity is increasing in Saudi Arabia amongst Saudis and expatriates, especially in females due to the changes in dietary habits and a sedentary life style. Ultrasound appears to be a useful non-invasive tool to determine liver involvement with the fatty liver in obese adults even in the absence of hypertraninasemia(6).Although non-invasive diagnostic procedures, such as ultrasonography or computed tomography, have become sufficiently sensitive in order to diagnose fatty liver, in clinical practice it is still impossible to distinguish between simple steatosis and steatohepatitis without performing a liver biopsy. However, it is often difficult and sometimes unethical to propose a liver biopsy to a subject who is apparently healthy, particularly in view of the lack of an effective therapy. Therefore, in the light of new knowledge, fatty liver, especially macrosteatosis when associated with liver necrosis or inflammation (NASH), is increasingly recognized as a condition that could evolve into fibrosis, cirrhosis and, possibly, hepatocellular carcinoma(9–10). Fibrosis leading to cirrhosis can accompany virtually any chronic liver disease that is characterized histologically by the presence of hepatobiliary distortion and/or inflammation (11).The majority of studies available on the epidemiology of fatty liver have been performed in selected series and with retrospective designs and not on the general population(9).

Ultrasound is the noninvasive imaging tool of choice in the clinical diagnosis of NAFLD. The liver displays a homogeneous hyperechogenicity (bright liver) and, if more than 50% of the hepatocytes contain fat, its lower margin usually becomes rounded. If more than 30% of hepatocytes are fat-laden, ultrasound diagnosis of hepatic steatosis has a sensitivity of 85% (12).Hepatic MRI(Magnetic Resonance Imaging) has a number of advantages, including operator independence and reproducibility and the possibility of acquiring in-phase (water) and opposed-phase (fat) images in one breath hold. Like ultrasound, MRI cannot distinguish NASH from simple steatosis or detect the presence of

fibrosis (13).Non-contrast CT scan of the abdomen gains accuracy in predicting steatosis only when the steatosis is greater than 30% (14).

The aim of this study is to screen the liver of Najran patients between (20-60) years old in king Khalid Hospital during the period Dec 2011- Dec 2012 to assess the prevalence (rate) of fatty liver and its relation with risk factors.

2. Material and Methods

This is a retrospective, cross sectional study using data from King Khalid Hospital in Najran, with an aim to assessing the rate of fatty liver among Najran patients 20-40 years old during the period Dec 2011 to Dec 2012 using ultrasonography and CT scan. The data for 957 patients who had undergone ultrasound for different abdominal disease was collected. 319 cases were found to have fatty liver. Data of this study were collected by check list from king Khalid hospital using PACS (picture archive and communicating system) which included personal information and information from the result of the ultrasound and CT scan examinations. Fatty liver was diagnosed by ultrasonography using an ATL HDI 5000 abdominal probe at 2.5-3 MHz. Longitudinal, sub-costal ascending and oblique scans were performed.

The ultrasonographic criteria of liver, kidney echo discrepancy, presence of hyperechoic (bright) echo penetration into the deep portion of the liver and clarity of liver blood vessel structures were used to diagnose fatty liver. Ethical aspect was be very carefully considered at the time of the study informed and verbal consent was taken from king Khalid hospital and Najran university to preformed and spublihed the study.

3. Data Analysis

Statistical analyses were performed using the SPSS software (Statistical Package for the Social Sciences).

4. Result

Data for a total of 957 patients who had undergone abdominal ultrasound were collected. 319 were diagnosed to have fatty liver disease. 10% of the patients had been given a CT scan. The mean age of the study group was (49.6 ± 14.1) , mean weight was (78± 6.12). An elevated level of ALT (alanine aminotransferase) and AST (aspartate aminotransferase) was detected in 55.7 % and 43.2% of the patients, respectively. All investigations for liver enzyme were not done in all patients. A BMI (Body Mass Index) > 25kg/m2 was detected in 80 % of the patients. The prevalence of NAFLD was 33.3 % and it was more common in 178 females (55.4%) than in 141 males (44.1%). See figure 1. It is highest in the age group 40-60. In the patients with NAFLD diabetes (high fasting glucose) was present in 77 (24.1%) of the patients; obesity in 147 patients (45.7% of all patients); high cholesterol was present in 23 patients (7 %), (see figure 2) and182 of the patients (57%) had hepatomegally as assessed by ultrasound.

Table 1: Characteristic of Study group. Mean ± SD (Standard Deviation)

Variable	*Value*
Age year	49.6 ± 14.1
Sex %	Male44.2 %
	Female 55.4%
Diabetes %	24.10%
Obesity %	45.70%
High cholesterol%	7%
Hepatomegally %	57%

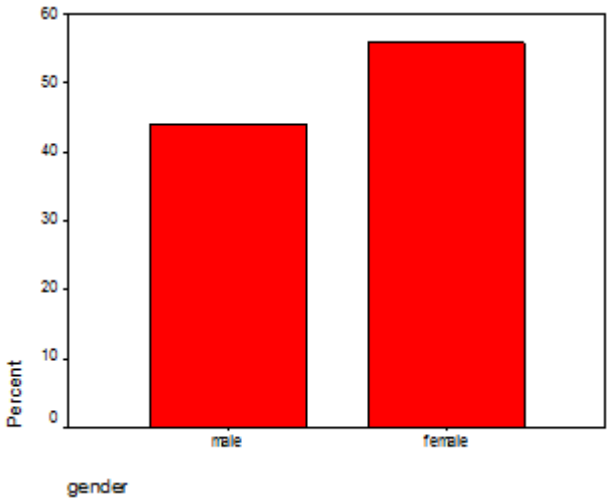

Figure 1: Relationship between NAFL and patient gender in study group

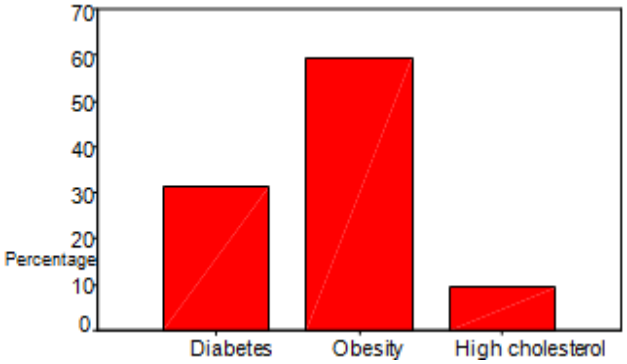

Figure 2: Risk factors associated with fatty liver

5. Discussion

Fatty infiltration of the liver can be detected by ultrasonography or CT scan (15). Since the fat distribution in the liver is uneven, the sensitivity of these imaging techniques for fatty infiltration is only 60 % (16, 17). However, this sensitivity may increase to 80 to 90% when more than half are hepatocytes in the image region infiltration. The rate of NAFL, as diagnosed by ultrasound in our study population, was high (33.3 %) and it was more common in 178 female (55.4%) than in 141male (44.1%) patients and this agrees with a previous study done on obese patient in the western part of Saudi Arabia(18).

To our knowledge, this is first study to detect the rate of FLD using ultrasonography done in Najran-King Khalid Hospital. In Saudi Arabia, the prevalence of NAFLD as evaluated by computed tomography is about 10% (6).Our study found that only 10 % of the patients had a CT scan.

Overweight and obesity are co-existing risk factors for fatty liver in Saudi Arabia and it is more prevalent in females. This agrees with our study which shows a strong relationship between obesity and fatty liver.

The number in the fatty liver disease group was small. This is probably due to using a PACS system in operation for only one year in Najran-King Khalid Hospital.

The majority of patients with fatty liver are asymptomatic (19). 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 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 symptoms were more or less in accordance with that reported by Matteoni (20). The commonest underlying risk factors for FLD in the study population were similar to those reported earlier (19, 21, 22) (Table.2).

Table 2: Comparison of studies of patients with NAFLD

Author	*n*	*Age (years)*	*Female (%)*	*Diabetes (%)*	*Obesity (%)*
Bacon [21]	33	47	42	21%	39
Ludwig [22]	20	54	65	50%	90
Lee [19]	49	53	78	51%	69
Matteoni [20]	132	53	53	33%	70

6. Conclusion

The prevalence of fatty liver in Najran patients is high. It is more common in females than in males. Obesity and diabetes are the common risk factors associated with fatty liver. A prospective study which includes a large sample size is needed in the future.

References

[1] Sherlock 1d S, Dooley J (editors). Diseases of the Liver and Biliary System, 11th edition. Oxford: Blackwell Science, 2002.

[2] Day CP, Yeaman SJ. The biochemistry of alcohol-induced fatty liver. Biochim Biophys Acta 1994; 1215:33–48.

[3] Teli MR, James OFW, Burt AD, Bennett MK, CP Day. The natural history of nonalcoholic fatty liver: a follow-up study. Hepatology 1995; 22:1714–1719.

[4] Farrell GC,Larter CZ Nonalcoholic liver disease from steatosis to cirrhosis . Hepatology 2006, 43:S00 S112.

[5] Garra BS, Insana MF, Shwker TH, Russell MA. Quantitative estimation of liver attenuation and echogenicity: normal state versus diffuse liver disease .Radiology 1987; 162:61-67.

[6] Adler M, Schaffner F (1979) Fatty liver hepatitis and cirrhosis in obese patients. Amer J Med 67: 811–6.

[7] Al-Quorain A, Satti MB, AL-Hamdan AR , AL-Gindan Y , Ibrahim E, Khatib R , AL-Freihi H . Pattern of chronic liver disease in the eastern province of Saudi Arabia. A hospital –based clinicopathological study. Trop Georg Med 1994; 46:358-360.

[8] EL-Hassan AY, Ibrahim EM, AL –Mulhim FA, Nabhan AA, Chmmas MY. Fatty infiltration of the liver: analysis of prevalence, radiological and clinical feature and influence on patient management. B J Rdiol 1992; 65:774-778.

[9] Neuschwander-Tetri BA, Caldwell SH. Nonalcoholic steatohepatitis: summary of an AASLD single topic conference. Hepatology 2003; 37:1202–1219.

[10] Falck-Ytter Y, Younossi ZM, Marchesini G, McCullough AJ. Clinicalfeatures and natural history of nonalcoholic steatosis syndromes. Semin Liver Dis 2001; 21:17–26.

[11] Friedman SL. Liver fibrosis – from bench to bedside. J Hepatol 2003; 8(suppl 1):S38–S53

[12] Ryan CK, Johnson LA, Germin BI, et al (2002) One hundred consecutive hepatic biopsies in the workup of living donors for right lobe liver transplantation. Liver Transpl 8: 1114–22

[13] Anna Al, Melania MA, Rita DE, and Valerio NO (2010).M. Freemark, DOI 10.1007/978-1-60327- 874-4_15, C _ Springer Science + Business Media. Contemporary Endocrinology: Pediatric Obesity: Etiology, Pathogenesis, and Treatment.

[14] Park SH, Kim PN, Kim KW, et al. Macrovesicular hepatic steatosis in living liver donors: use of CT for quantitative and qualitative assessment. Radiology. 2006; 239:105–12.

[15] Zwiebel WJ. Sonographic diagnosis of diffuses liver disease. Br J radiol 1992; 65:774-778.

[16] Foster KJ, Dewbury KC, Griffith AH et al. The accuracy of ultra sound in the detection of fatty infiltration of the liver. BRJ Radiol 1980; 53: 440-442.

[17] Matsui O, Kadoya M, Takahashi et al. Focal sparing of segment IV in fatty liver shown by sonography and CT. AJR 1995; 164: 1137-1140.

[18] Faiza. A.Qari, and, Aisha AL- Ghamdi. Fatty liver in overweight and obese patients in Western part of Saudi Arabia. Journal of the Bahrain Medical Society, Volume 17, No. 2, April 2005

[19] Lee RG. Non-alcoholic steatohepatitis: A study of 49 patients. Hum Pathol 1989; 20: 594-598.

[20] Matteoni CA, Younossi ZM, Gramlich T, Boparai N, Liu YC. Nonalcoholic fatty liver disease: a spectrum of clinical and pathological severity. Gastroenterology 1999; 116: 1413–1419.

[21] Bacon BR, Frahvash MJ, Janney CG, et al. Nonalcoholic steatohepatitis: anexpanded clinical entity. Gastroenterol 1994; 107:1103-1109.

[22] Ludwig J, Olsem TS, McGill DB et al. Nonalcoholic steatohepatitis: Mayo Clin experiences with a hitherto unnamed disease. Mayo Clin Proc 1980; 55: 434-438