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ORIGINAL ARTICLE

Prevalence and Demographic Characteristics of Non-Alcoholic Fatty Liver Disease in Corpses at Kerman Forensic Medicine Center, 2011

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ABSTRACT

Introduction: Fatty liver is a multi-factorial gastrointestinal disorder that can lead to different disease and finally death. It is mostly silent without any obvious symptoms. This study is designed to determine the prevalence fatty liver after cadaver autopsy in 102 cadaver and its correlation with associated risk factors. **Method:** Liver autopsy was done on 102 cadaver refereeing to the legal medicine ward of Kerman on 2013. Clinical information and pathologic findings were recorded in statistical checklist. Finally data were analyzed with fisher's exact test and mann-whitney U statistical test in SPSS environment ver.20. **Results:** Mean of age was 43.25 ± 4.25 Pathologic findings showed 18(17.64) fatty liver. None of risk factors showed a significant relation with the prevalence of fatty liver (P>0.05). **Conclusion:** According to the finding and based on similar scientific evidences fatty liver in this study has higher prevalence rate in compared with other studies and more detailed study with larger sample sizes is recommended for more accurate findings.

INTRODUCTION

Non-alcoholic fatty liver disease (NAFLD) is known as the most prevalent cause of chronic liver disease in most parts of the world (1-3). NAFLD is histologically similar to alcoholic liver disease, however, is not related to alcohol consumption and is found to be one the frequent hepatic disorders. Patients are in a wide range regarding liver involvement. A large number of patients have a simple lipid accumulation in liver cells. A more severe form of this disorder is called non-alcoholic steatohepatitis which is known as a part of NAFLDes range (4).

Non-alcoholic fatty liver can lead to cirrhosis and hepatic failure (5). Appearance of these changes has been observed in different conditions such as obesity and hyperlipidemia (5,6), adult diabetes (7), and abetalipoproteinemia (5,7,8) as well as taking some medicines including amiodarone, glucocorticoids, synthetic estrogens, insulin, chloroquine, tamoxifen (8). Histological appearance of NAFLD ranges from lipid accumulation in NAFLD hepatocytes, with no inflammation or fibrosis (simple hepatic steatosis) to hepatic steatosis with one inflammatory-necrotic part (steatohepatitis) accompanied by fibrosis or not (9).

Liver biopsy is regarded as the gold standard for diagnosis of NAFLD. End-stage NAFLD patients should be considered for liver transplant. On the other hand, with increased prevalence of this disease in Iran, it has become one of the main reasons of liver transplant in the country.

In the present study, we tried to investigate the prevalence of NAFLD in the corpses at the autopsy hall of Kerman Forensic Medicine Center, 2011 as a limited study population in order to provide appropriate diagnostic and therapeutic strategies by epidemiological information obtained in this study.

METHOD

This was cross-sectional study that conducted on all corpses referred to Forensic Medicine Center in 2011, Kerman, Iran province.

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This study was confirmed in Ethics Committee of Kerman University of Medical Sciences. All data collected in this study were considered as confidential and were only generally reported.

A checklist was designed by the researchers to collect the required data through the deceased records as well as autopsy, pathology, and toxicology reports. In case of incomplete information, data were gathered with the help of their relatives. Data used in this study included age, gender, height, weight, body mass index (BMI), and the deceased education as demographic variables. Also the history of addiction, drug use, hyperlipidemia, cardiovascular diseases, hepatic and metabolic diseases, and abdominal pain were recorded for each person.

Statistical Analysis

The data were analyzed by SPSS where quantitative data were reported as mean and SD and qualitative ones as frequency and percentage. Chi-square was used for comparison of qualitative variables and independent t-test for quantitative data. The significance level was considered as 0.05.

RESULTS

In this study, totally 103 corpses (87 males) were investigated. Mean±SDage and BMI were, respectively, 43.32 ± 16.75 years and 24.48 ± 4.88 kg/m^2. The investigated corpses did not show any history of alcohol consumption, hyperlipidemia, hepatic diseases, diabetes, and right upper quadrant tenderness. Among all corpses, 63 cases (61.2%) had been self-employed, 24 (23.3%) unemployed, and 16 (15.5%) labor. According to toxicology findings, in 41 cases (39.8%) no toxic substances were found, while 46 cases (44.7%) were reported with methadone, codeine, and morphine toxicity, 14 cases (13.6%) with caffeine, and 2 cases of toxicity (1.9%) with other toxic substances.

The causes of death in the study corpses were listed as follows: 41 cases (39.8%) of drug overdose, 20 (19.4%) cardiac ischemic diseases, 16 (15.5%) internal diseases, 13 (12.6%) pneumonia, and 13 (12.6%) suicide. Table 1 indicates the frequency of other cases as the cause of death (Table 1).

Comparing mean age, height, and weight of the corpses with a history of abnormal liver enzymes, only their age was significantly lower than other cases (P = 0.03), no considerable difference was observed in other factors. In contrast, BMI was significantly higher in the corpses with a history of abnormal liver enzymes compared with other corpses (28.78 ± 8.39 vs. 23.74 ± 3.70; P = 0.00). No meaningful association was found between gender and the status of liver enzymes (Table 2)

Comparing the frequency distribution of other variables in corpses with increased liver enzymes with other corpses, no significant difference was reported except for the case of cardiac diseases, BMI >25 kg/m^2, and fatty liver (Table 3).

Table 1. Clinical histories of the study corpses

	N (%)
Education	
Illiterate	30 (29.1)
Primary and high school	39 (37.9)
Diploma	27 (26.2)
Higher education	7 (6.8)
Use of Morphine	
Yes	31 (30.1)
No	72 (69.9)
Cigarette smoking	
Yes	31 (30.1)
No	72 (69.9)
Use of corticosteroid	
Yes	1 (1)
No	102 (99)
Cardiovascular diseases	
Yes	10 (9.7)
No	93 (90.3)
Hypertension	
Yes	4 (3.9)
No	99 (96.1)
Pathological findings of liver	
Steatohepatitis	9 (8.7)
Chronic hepatitis	41 (39.8)
Fatty liver	14 (13.6)
Others	39 (37.9)
Atherosclerosis	
Yes	25 (24.3)
No	78 (75.7)
Coronary artery disease	
Yes	23 (22.3)
No	80 (77.7)
Myocardial infarction	
Yes	3 (2.9)
No	100 (97.1)
Old myocardial infarction	
Yes	9 (91.3)
No	94 (8.7)
Liver tests	
Abnormal	14 (13.6)
Normal	87 (86.4)

DISCUSSION

In the time of study, 103 corpses were referred to Kerman Forensic Medicine Center and investigated in the time of study. Regarding cause of death, drug overdose had the highest frequency. The age of corpses with abnormal liver enzymes was significantly lower than others, while BMI was notably higher in these cases. Cardiac disease, BMI >25 kg/m^2, and fatty liver were more observed in corpses with abnormal liver enzymes compared with other corpses.

NAFLD is histologically similar to alcoholic liver disease, however, it is not relevant to alcohol consumption

Table 2. The results of liver tests in the study corpses by gender

Status of liver enzymes Corpses gender	N (%)			P value
	Negative	Positive	Total	
Male	75 (86.2)	11 (78.6)	86 (85.1)	0.46
Female	12 (13.8)	3 (21.4)	15 (14.9)	
Total	87 (100)	14 (100)	101(100)	

Table 3. Liver enzymes disorders in the study corpses

	N (%)	P
Education		
Illiterate	4 (28.6)	0.24
Primary and high school	6 (42.9)	
Diploma	3 (21.4)	
Higher education	1 (7.1)	
Use of Morphine		
Yes	7 (50)	0.72
No	7 (50)	
Cigarette smoking		
Yes	3 (21.4)	0.42
No	11 (78.6)	
Use of corticosteroid		
Yes	0 (0)	0.69
No	14 (100)	
Cardiovascular diseases		
Yes	4 (28.6)	0.01
No	10 (71.4)	
Hypertension		
Yes	1 (7.1)	0.51
No	13 (92.9)	
Pathological findings of liver		
Steatohepatitis	0 (0)	0.00
Chronic hepatitis	0 (100)	
Fatty liver	14 (0)	
Others	0 (0)	
Atherosclerosis		
Yes	4 (28.6)	0.65
No	10 (71.4)	
Coronary artery disease		
Yes	4 (28.6)	0.58
No	10 (71.4)	
Myocardial infarction		
Yes	1 (7.1)	0.32
No	13 (92.9)	
Old myocardial infarction		
Yes	1 (7.1)	0.82
No	13 (92.9)	
BMI>25		
Yes	10 (83.3)	<0.001
No	2 (16.7)	

and is known as a frequent liver disease (6). This disorder is likely to develop at any age and gender (10,11). Some medical cases and histories such as obesity (5), hyperlipidemia (5,10), adult diabetes (7), and use of some drugs such as amiodarone, glucocorticoids, synthetic estrogens, insulin, chloroquine, and tamoxifen (12) can increase the chance of NAFLD incidence. In this regard, various studies have considered central obesity, diabetes mellitus in adults, dyslipidemia, and metabolic syndrome as the main risk factors of NAFLD.

The investigated corpses did not show any history of alcohol consumption, hyperlipidemia, liver diseases, diabetes, and right upper quadrant tenderness. Differences in findings compared with the mentioned studies and not observing main risk factors in the study corpses could be due to small sample size and that the study was limited to one center, as well as defects and biases in data collection and medical histories. As confirmed in our study, patients with NAFLD are generally asymptomatic with a mild and fluctuating increase in their liver enzymes. In agreement with the results of our study, the most common laboratory disorder in these patients is a slight to average increase in aminotransferases which is two to five times above normal (13).

The present study was limited by small sample size and, and as a result, this cannot be an appropriate epidemiological study for investigating the causes of alcoholic fatty liver. Therefore, multicenter studies are recommended to identify, record, and report the cases of NAFLD.

CONCLUSION

According to the results of this study, it can be concluded that fatty liver and its relevant pathological findings can be found in a majority of corpses. Regarding hidden nature of this disease until the development of pathological changes in liver which limits management and treatment of the patients, it seems that multicenter studies along with more accurate data collection could provide a complete and proper image of the status of this disease in the country corpses.

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AUTHOR'S CONTRIBUTIONS

All authors contributed to this project and article equally. All authors read and approved the final manuscript.

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