

## Original Research Article

# Prevalence of non-alcoholic fatty liver disease and its risk factors in patients referred to Ardabil city hospital during 2015-2016

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### ABSTRACT

**Background:** Fatty liver is the most common liver disease worldwide, and the number of people with this disease is increasing in the world and in Iran. The aim of this study was to determine the prevalence of non-alcoholic fatty liver disease and its risk factors in patients referred to Ardabil city hospital during 2015-2016.

**Methods:** This is a cross-sectional descriptive study which was done on 80 patients with fatty liver Referred to Ardabil city Hospital during 2015-2016. Required information including age, gender, degree of fatty liver, body mass index, serum lipids, liver aminotransferases, serum uric acid, and diabetes mellitus were collected by a checklist and then analyzed by statistical methods in SPSS.19.

**Results:** 40% of the patients were males and 60% were females. The mean age of the patients was  $49.22 \pm 14.58$  years. 81.2% of the patients were overweight or had some degree of obesity. ALT in 38.5%, AST in 32.5%, ALP in 13.75%, and bilirubin in 21.25% of patients were above their normal range. Total cholesterol in 35%, triglyceride in 50%, and LDL in 17.5% of patients were higher than normal range, and HDL was lower than normal range in 41.2% of patients. 21.25% of patients had hyperuricemia and 38.8% had diabetes.

**Conclusions:** The results showed that non-alcoholic fatty liver is more prevalent in females and older ages. Doing multi-center studies was recommended in Ardabil province or other provinces in Iran in future.

**Keywords:** Non-alcoholic fatty liver, Risk factor, Ardabil

### INTRODUCTION

The liver is one of the most vital parts of the body that has various functions, such as storage of sugars and glycogen, blood purification and the production of certain enzymes, which are essential for the life.<sup>1</sup> Fatty liver is the most common liver disease worldwide, and the number of people with this disease is increasing in the world and in Iran.<sup>2-5</sup> Fatty liver disease has not a symptom and is a silent disease which it is usually detected by referring to ultrasound for another illness or when it appears that affects the liver tissue and affects the normal functioning of the liver.<sup>6</sup>

Prevention and self-care is essential for the prevention of fatty liver in non-infected people and its treatment and control for all people is very important. The first step in prevention of fatty liver and its control was to determine its risk factors.<sup>7-11</sup>

The prevalence of this disease in general population was 20 to 30 percent and according to the increasing risk factors of metabolic syndrome, this disease is one of the most common causes of liver disease in Western society. The causes of non-alcoholic fatty liver disease is unknown but many risk factors such as obesity, the amount of fat intake, the increase in body fat, hyperlipidemia, hypertension, type II diabetes, breast cancer, pregnancy, long hunger, and long-term use of

some medications, such as corticosteroids had main role in its occurrence.<sup>4,8,9</sup>

The aim of this study was to investigate the prevalence of fatty liver and its risk factor in patients referred to Ardabil city hospital during 2015-2016.

### METHODS

This cross-sectional descriptive study was conducted on 80 patients with fatty liver disease that referred to the hospital of Ardabil city during 2015-2016. Necessary informations such as sex, age, degree of fatty liver, BMI, serum lipids, liver aminotransferases, serum uric acid and diabetes collected by a checklist and then analyzed by statistical methods in SPSS.16.

### RESULTS

Of all patients 32 (40%) were male and rest of them were female. The mean age of patients was  $49.32 \pm 14.6$  (range: 23-81) and most of patients were in age group 40-49 years with 31.3% (Figure 1).

Hyperuricemia and diabetes was seen in 21.3% and 38.8% of patients, respectively.

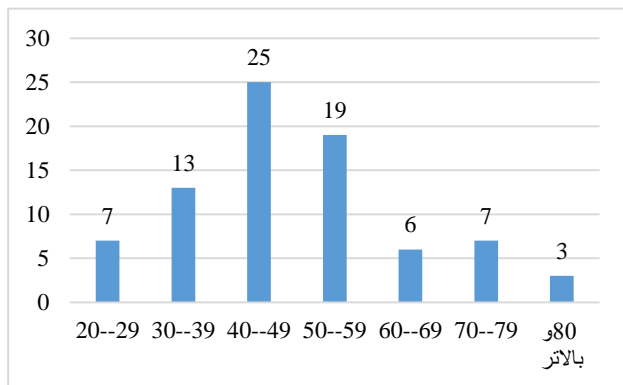


Figure 1: Age distribution of patients.

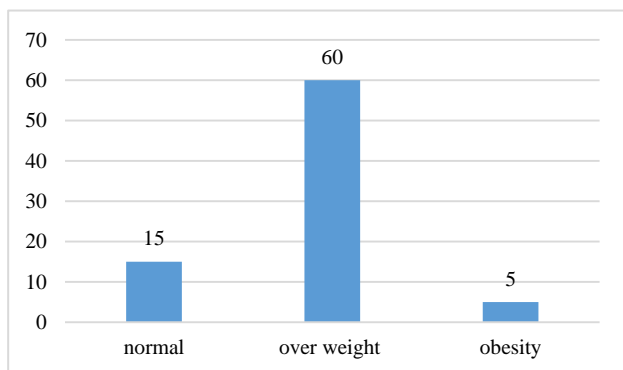


Figure 2: The BMI status of patients.

Of all patients 37 (46.2%) had overweight ( $25 \leq \text{BMI} \leq 30 \text{ Kg/m}^2$ ) (Figure 2).

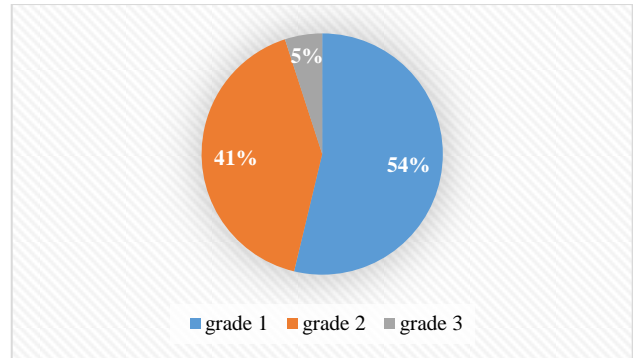


Figure 3: The status of grade of fatty liver in patients.

The most grade of fatty liver in patients was grade 1 which was seen in 43 (53.8%) of patients (Figure 3).

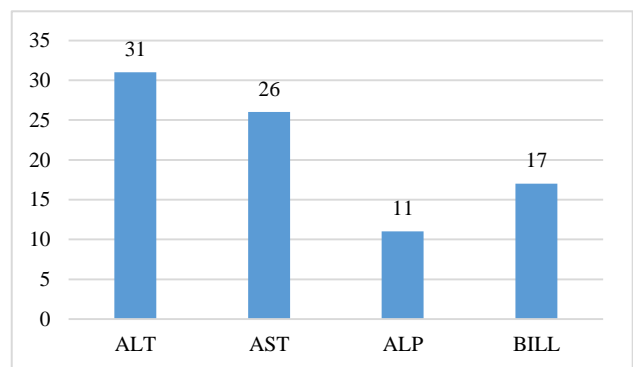


Figure 4: The frequency of elevated levels of liver aminotransferases and bilirubin in patients.

Of all patients 38.8% had ALT (Figure 4).

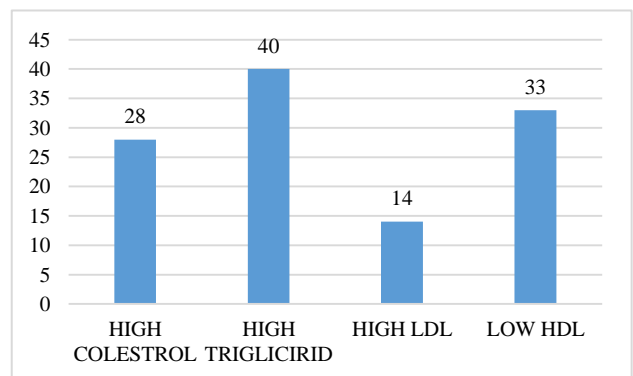


Figure 5: The frequency of dislipidemia in patients.

The high cholesterol was seen in 28 (35%) of patients (Figure 5).

### DISCUSSION

In this study the mean age of patients was  $49.32 \pm 14.6$  (range: 23-81) and 75% had age upper than 40 years. Shima and et al studied the effect of age and life style on the development and progression of the fatty liver and

showed that age had significant relation with non-alcoholic steatohepatitis in fatty liver patients.<sup>12</sup>

In a study, Brea and Puzo reported that the prevalence of non-alcoholic fatty liver increase with age so that its prevalence increased to more than 40% in patients older than 60 years of age.<sup>13</sup>

In a retrospective study by Frith and et al, there was a relation between age increasing and degree of fibrosis and also the non-alcoholic steatohepatitis and Cirrhosis in patients older than 50 years more prevalent than younger group.<sup>14</sup>

In another study, age reported as a risk factor for Liver steatosis and also reported that patients with upper age have more probability to death and development of disease to fibrosis and hepatocellular carcinoma.<sup>15</sup>

So we could say that the relation between age and fibrosis development in patients with non-alcoholic fatty liver disease which can be related to long duration of disease in patients with older ages. The results of this study showed that 60% of patients were female and 40% were male and the frequency of fatty liver in female was 1.5 times more than male. In totally, there were contradictory results in the relation between sex and non-alcoholic fatty liver so that most of studies reported the higher rate of disease in male and some studies reported the higher rate of disease in female.<sup>16</sup>

Similar to our study results, Stepanva and et al in a study showed that there wasn't difference between rates of disease in male and female but non-alcoholic steatohepatitis in women was more than men.<sup>17,18</sup>

Some studies showed that the gender male is a risk factor for non-alcoholic fatty liver and contradictory results can be due to study design and methods of diagnosis fatty liver.<sup>15,9-22</sup>

In our study, only 18.8% of patients have normal weight and 81.2% had overweight or obesity.

The BMI is a main risk factor for non-alcoholic fatty liver and in a study, the prevalence of non-alcoholic fatty liver in non-obese people was 19.94% and obese people was 75.05%.<sup>23</sup>

The prevalence of non-alcoholic fatty liver was reported more than 90% in patients that candidated for obesity surgery. Of course, it should be noted that previous studies have shown that weight loss is associated with the relief of liver steatosis and other histological enhancements.<sup>24-26</sup>

The importance of weight control was recommended for prevention of non-alcoholic fatty liver in obese and non-obese people.<sup>27,28</sup>

The results of this study showed that Alanine aminotransferase (ALT) in 38.8% of patients was upper than normal range and could say that in generally, the liver enzymes has relation with prevalence and development of non-alcoholic fatty liver. In some recent studies, increase in liver enzymes known as an invasive index in non-alcoholic fatty liver and these enzymes directly reflect the histological changes of the liver and the intensity of non-alcoholic fatty liver.<sup>23,29-31</sup>

The high prevalence of dyslipidemia in patients with fatty liver showed that the cholesterol in 35% of patients, Glycerin in 50% and low density lipoprotein (LDL) in 17.5% of patients was upper than normal range. Also, results of this study showed that 21.3% of patients with fatty liver had Hyperuricemia. In line with our study, the result of a study showed that the high levels of uric acid, triglycerid, cholesterol, LDL, HDL, ALT and AST are risk factors for fatty liver disease which independently relation with prevalence of disease.<sup>23</sup>

Hyperuricemia is a prevalent finding among non-alcoholic fatty liver patients in recent studies and it was showed that independent of the status of insulin resistance and the metabolic syndrome of the patient, hyperuricemia had significant relation with histologic results in non-alcoholic fatty liver.<sup>32</sup>

In current study, 38.8% of patients with fatty liver, had also diabetes and other studies have shown that diabetes and non-alcoholic fatty liver are closely interrelated.<sup>33,34</sup>

Also a study has shown that type 2 diabetes is an independent predictor of non-alcoholic fatty liver.<sup>35</sup>

## CONCLUSION

The results of this study showed that non-alcoholic fatty liver is more prevalent in female and older age groups and abnormal finding such as obesity, ALT, dyslipidemia, Hyperuricemia and diabetes is more prevalent in these patients and it seems that these factors play a major role in the development of non-alcoholic fatty liver and its prevalence in the society.

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