

Epidemiology of Fatty Liver Disease in the Irkutsk Region (Russia)

Tirikova O VI^{1*}, Kozlova NM¹, Eliseev SM², Tarasov AU³ and Lunenok SV⁴

¹*Department of Faculty Therapy, Irkutsk State Medical University, Irkutsk, Russian Federation*

²*Irkutsk City Clinical Hospital №3, Irkutsk, Russian Federation*

³*Irkutsk State Medical University, Irkutsk, Russian Federation*

⁴*Forensic Histology Department, Irkutsk Regional Bureau of Forensic Medical Examination, Irkutsk, Russian Federation*

***Corresponding Author:** Tirikova O VI, Department of Faculty Therapy, Irkutsk State Medical University, Irkutsk, Russian Federation.

Received: May 29, 2021; **Published:** November 25, 2021

Abstract

Aim: Is to study the epidemiology of fatty liver disease among the population of the Irkutsk region.

Materials and Methods: The study was conducted on the basis of "Irkutsk Regional Bureau of Forensic Medical Examination". The object of the study was medical documentation - "The act of autopsy".

Results: In total, 7246 autopsy reports were studied in 2012. Morphological signs of fatty liver disease were detected in 1602 (22.1%) cases.

Findings: 1. Fatty liver disease among residents of the Irkutsk region is 22.1%, and does not depend on gender: for women, 21.8% and for men, 22.3%; 2. Fatty liver disease is significantly more common in women in the age groups from 25 to 59 years, in other age groups there is no difference between men and women. People of young, old age and long-livers are least susceptible to fatty liver disease; 3. The median life expectancy of those who died of cardiovascular diseases with steatohepatitis is 2.5 years less than with steatosis, while the DALY index with steatosis is 13.6 years, and with steatohepatitis is 13.5 years, which has no significant difference.

Keywords: *Fatty Liver Disease; Steatohepatitis; Steatosis*

Abbreviations

NAFLD: Non-Alcoholic Fatty Liver Disease; NASH: Non-Alcoholic Steatohepatitis; FLD: Fatty Liver Disease

Introduction

Non-alcoholic fatty liver disease (NAFLD) is increasingly being diagnosed worldwide and is considered the most common liver disease in Western countries. It includes steatosis, non-alcoholic steatohepatitis (NASH) and cirrhosis of the liver. NAFLD is closely associated with dyslipidemia, obesity, insulin resistance, and hypertension and is currently considered by some scientists as a hepatic manifestation of metabolic syndrome [1].

The complexity of studying fatty liver damage is due to the slow progression of the disease over many years and decades, and the literature data on morbidity and mortality are contradictory. At the same time, since the laboratory and histological signs of alcoholic steatosis and non-alcoholic steatosis are very similar, it is suggested that the development of steatosis of mixed etiology should be taken into account [2].

Currently, data on the incidence of NAFLD vary, but there is a steady trend towards an increase in diabetes, obesity and metabolic syndrome, with which they are etiopathogenetically closely related [3]. Based on this, it is possible to assume an increase in the prevalence of NAFLD, however, since liver biopsy is the only method of accurate diagnosis, and studies involving this method are few, the true figures for the incidence of NAFLD have not yet been established [4].

Studies show that 20 to 30% of the adult population of European countries suffers from NAFLD, and its prevalence increases from 70 to 90% among people who are obese or have diabetes mellitus [5]. In the United States, this pathology is the most common liver disease, which affects up to 46% of middle-aged people, of which 12.2% is accounted for by NASH. Approximately 10% of liver transplants performed in the United States due to cirrhosis are associated with NAFLD [6].

According to the results of the Russian study DIREG 1 (2007), the prevalence of NAFLD in outpatient patients was 27%, of which 80.3% were diagnosed with steatosis, 16.8% with steatohepatitis, and 2.9% with cirrhosis of the liver [7]. The DIREG 2 study (2015) showed that the prevalence of NAFLD was already 37.3%, showing an increase of 10% over 7 years in comparison with the data of DIREG 1, while the number of patients with cirrhosis of the liver in the outcome of NAFLD increased to 5% [8]. But these studies did not include liver biopsy, and the diagnosis was made on the basis of non-invasive research methods.

The prevalence of NAFLD is such that we can talk about an epidemic. According to the results of the study of 29 publications devoted to the epidemiology of non-alcoholic fatty liver disease [4], the incidence of non-alcoholic steatosis and steatohepatitis in the adult population varies significantly and is 2.8% - 88% and from 1 to 56%, respectively [4]. The apparent inconsistency of the data presented by the author, as well as the lack of large-scale studies on the territory of the Russian Federation, indicates the need for a thorough study of the exact incidence of NAFLD, since understanding the epidemiology of this pathology is important for developing an effective prevention and treatment strategy.

Aim of the Study

To study the epidemiology of fatty liver disease (FLD) among the population of the Irkutsk region.

Materials and Methods

Tasks:

1. To study the prevalence of FLD among the population of the Irkutsk region;
2. Determine the frequency of FLD in different age groups, and compare it among men and women;
3. Find out the relationship of FLD with life expectancy.

Type of study: Hypothesizing one-step passive retrospective.

The object of the study: Medical documentation - "The act of pathoanatomical autopsy". The study was conducted on the basis of the Irkutsk Regional Bureau of Forensic Medical Examination. Since the study protocols did not contain detailed information about the anamnesis of the deceased, it was not possible to differentiate the alcoholic genesis of fatty liver degeneration from the non-alcoholic one. This forced us to use the term "Fatty liver disease".

Inclusion criteria: Availability of protocols for morphological examination of the liver.

Exclusion criteria: Incomplete information on age, cause of death, age under 18.

Tools: For statistical analysis, the program Statistica 13.0 for Windows was used.

Results and Discussion

A total of 7246 autopsy reports were studied, carried out in 2012 at the Irkutsk Regional Bureau of Forensic Medicine. There were 4,763 males (65.7%) and 2,482 females (34.3%). The average age of the deceased was 55.5 (min 18, max 100, Me 56), while for men the

figure was 52.5 (min17, max 89, Me 54), for women 61.3 (min17, max 100, Me 62).

Morphological signs of FLD were detected in 1602 (22.1%) cases of the total number of autopsies performed. The average age of the deceased in this category was 51.4 years (min 19, max 95, Me 52). There were 1,061 males (66.2%) and 541 females (33.8%). The frequency of fatty liver in men and women were comparable and amounted to 1061(22.3%) and 541(21.8%), respectively (p = 0,65).

The highest prevalence of FLD is set in the middle age group 45 - 59 years and accounted for 30.4% of cases, values between age groups have significant differences (Table 1).

Gender	Age						Total
	Youth	Young	Middle	Presenile	Senile	Elderly	
	18 - 24	25 - 44	45 - 59	60 - 74	75 - 90	> 90	
Men	28 (13%)	511 (26,2%)	610 (30,4%)	330 (18%)	120 (9,8%)	3 (3,7%)	1602
p < 0,05	p = 0,001		p = 0,001		*p = 0,011		
		p = 0,003		p = 0,001			

Table 1: Distribution of FLD in age groups among all the deceased (abs.).

*: Calculation in absolute values (% intra-group distribution of shares).

It was found that the frequency of fatty liver damage depends on gender and age. The greatest prevalence of FLD was found at the age of 25 - 59 years (Table 2) and the lowest rates in the groups under 25 and over 75 years of age. Despite the fact that FLD is detected more often in women than in men, the rate of growth of the disease in men is 1.8 times higher than in women. In men, the increase in morbidity occurred by 0.75 cases per year, reaching “max” at the age of 50 ± 0.24 years, after which there was a decrease. In women, the increase in the incidence of FLD was 0.4 cases per year, reaching the “max” at the age of 55 ± 0.67 years. The rate of decline in the incidence of FLD also prevailed in men: the regression rate in men was -0.91 cases per year (after 50 years), and in women -0.37 (after 55 years) (Figure 1).

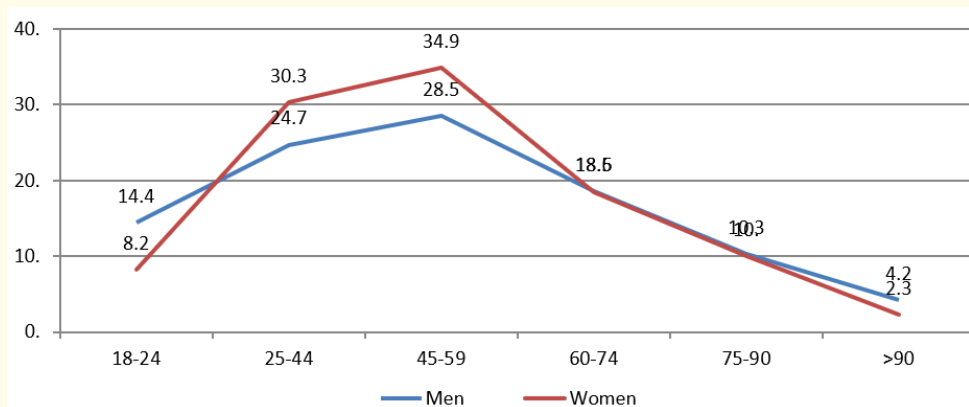


Figure 1: Frequency of occurrence of FLD in age groups (%).

Gender	Age						Total
	Youth	Young	Middle	Presenile	Senile	Elderly	
	18-24	25 - 44	45 - 59	60 - 74	75 - 90	> 90	
Men	24 (15,1%)	360 (24,7%)	401 (28,5%)	222 (18,6%)	53 (10,2%)	1 (5,0%)	1061
Women	4 (8,9%)	151 (30,3%)	209 (34,9%)	108 (18,5%)	67 (9,7%)	2 (3,4%)	541
p < 0,05 m-f	*p = 0,41	p = 0,014	p = 0,005	p = 0,94	p = 0,82	*p = 0,72	

Table 2: Distribution of FLD in men and women among all deceased (abs.).

The share of people of working age among men and women is 26.1% and 31.7%, respectively ($p = 0.013$).

Among the more than 250 literature sources studied in the course of the work, such observations and reasons explaining the sharp increase in fatty liver degeneration in the age group of 25 - 44 years in women were not found. We assume that this may be due to a natural change in the hormonal background in the female body and (or) taking a large number of medications. At the same time, men at this age period account for an increase in the intake of alcoholic beverages.

Morphological changes in the liver were as follows (Figure 2): steatosis was detected in 1411 cases (88.08%), steatohepatitis in 137 (8.55%) cases, liver cirrhosis in 52 (3.25%), and liver cancer was diagnosed in 2 (0.12%) against the background of fatty lesions (Figure 2).

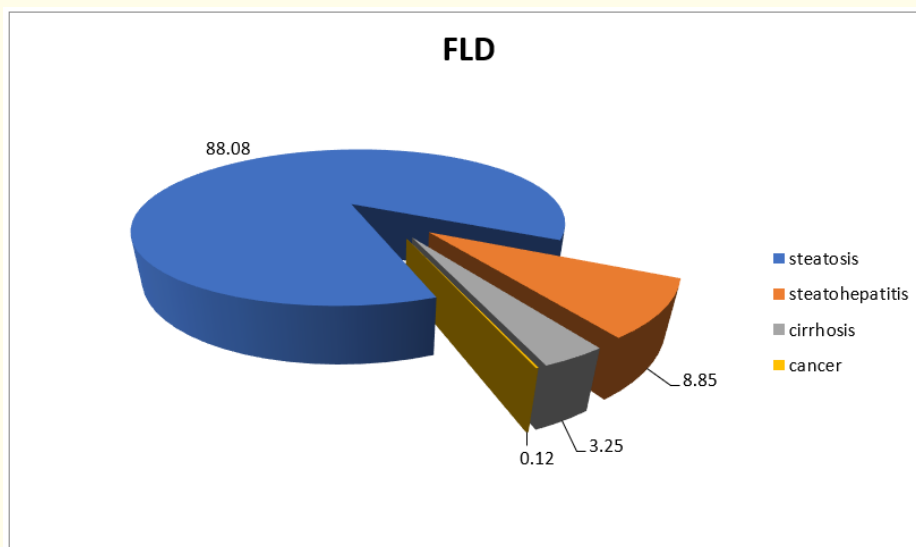


Figure 2: Structure of morphological changes in the liver.

The detection rate of steatosis ($n = 1602$) in men and women was 89.3% and 85.6%, respectively ($p = 0.028$). Steatohepatitis was significantly more common in women 10.7% than in men 7.4% ($p = 0.03$).

The direct cause of death in people with FLD in 33.6% of cases was cardiovascular disease. Median life expectancy: for steatosis, 56 years (min 20, max 95), and the lost years of life when calculating the average DALY index per person were 13.5 years; for steatohepatitis, 53.5 years (min 31, max 88), and the lost years of life when calculating the average DALY index per person were 13.6 years ($p = 0.95$). As the direct cause of death from cardiovascular pathology, the following were established: decompensation of chronic diseases of the cardiovascular system - 231 (43%), acute heart failure against the background of coronary heart disease (including acute myocardial infarction) 146 (27%), acute cardiovascular failure without ischemic heart disease - 105 (19%), acute cerebrovascular accident - 49 (9%), pulmonary embolism - 8 (2%).

Conclusion

1. The prevalence of gallstones among the inhabitants of the Irkutsk region is 22% and does not depend on gender: in women - 21.8% and in men - 22.2%; according to autopsy data, and in 70% of cases occurs in persons aged 25 to 59 years. At a young age, GBD occurs in every tenth person, and in middle-aged people already in every third person. The prevalence of gallstone

disease depends on age and is the lowest among centenarians, in old age and in young people, slightly higher among the elderly and the maximum occurrence in people of young and mature age.

2. Among patients with FLD in 33.6% of cases, the immediate cause of death was the pathology of the cardiovascular system. The highest peak in mortality from cardiovascular disease in patients with FLD occurs in the middle age (45 - 59 years).
3. Steatohepatitis is significantly more common in women, and steatosis in men.
4. The median life expectancy of those who died from cardiovascular diseases in steatohepatitis is 2.5 years less than in steatosis, while the Daly index in steatosis is 13.6 years, and in steatohepatitis is 13.5 years, which does not have a significant difference.

Acknowledgements

The author's team expresses its deep gratitude to the Irkutsk Regional Bureau of Forensic Medical Examination for their active assistance and participation in the implementation of such a large-scale project.

Conflict of Interest

There is no conflict of interest.

Bibliography

1. Lazebnik LB., *et al.* "Non-alcoholic fatty liver disease: clinical presentation, diagnosis, treatment (recommendations for therapists, 2nd version)". *Experimental and Clinical Gastroenterology* 2.138 (2017): 22-37.
2. Ivashkin VT., *et al.* "Alcoholic liver disease. Rational pharmacotherapy of diseases of the digestive system". A Guide for Medical Practitioners 2nd Edition. M: "Litterra" (2011): 844.
3. Kleiner DE., *et al.* "Design and validation of a histological scoring system for nonalcoholic fatty liver disease". *Hepatology* 41.6 (2005): 1313-1321.
4. Bellentani S and Marino M. "Epidemiology and natural history of non-alcoholic fatty liver disease (NAFLD)". *Annals of Hepatology* 8.1 (2009): 4-8.
5. Vernon G., *et al.* "Systematic review: the epidemiology and natural history of non-alcoholic fatty liver disease and non-alcoholic steatohepatitis in adults". *Alimentary Pharmacology and Therapeutics* 34.3 (2011): 274-285.
6. McCullough AJ. "The clinical features, diagnosis and natural history of nonalcoholic fatty liver disease". *Clinical Liver Disease* 8.3 (2004): 521-533.
7. Drapkina OM., *et al.* "Pathogenesis, treatment, epidemiology NAFLD - what's new? Epidemiology of NAFLD in Russia". *Russian Medical Journal* 28 (2011): 1717-1721.
8. Ivashkin VT., *et al.* "The prevalence of non-alcoholic fatty liver disease in patients with outpatient practice in the Russian Federation: the results of the DIREG 2 study". *Hepatology* 6 (2015): 31-41.

Volume 8 Issue 12 December 2021

©All rights reserved by Tirikova O VI., *et al.*