

## MORTALITY ANALYSIS OF THE PATIENTS WITH ALCOHOLIC LIVER CIRRHOSIS

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**Background.** Alcohol is considered to be the main risk factor for adverse event deaths around the world. In Ukraine, mortality due to alcoholic liver disease (ALD) has taken the second place in the structure of death causes from diseases of the digestive system.

**Objective.** The aim of the research was to study the peculiarities of the causes of death in the patients with alcoholic liver disease at the stage of liver cirrhosis (LC) based on the analysis of protocols of pathoanatomical research.

**Methods.** The analysis of 149 protocols of the pathoanatomical study of the patients, who died from alcoholic LC, has been carried out at the premises of the Pathoanatomical Department of the Ivano-Frankivsk Regional Clinical Hospital in 2006-2018.

**Results.** Most people were young and middle aged. Fatal cases were caused by decompensation of the LC with the development of hepatic, hepatic-renal, cardio-pulmonary insufficiency, pancreatic necrosis, gastrointestinal bleeding (GIB), sepsis, hepatocellular carcinoma (HCC). In 37.6 % of the patients the concomitant illness was coronary heart disease (CHD), 10.7 % of the people had hypertension. In 6 % of the patients, ischemic stroke of the brain was diagnosed. In most people atherosclerotic vascular changes were revealed.

**Conclusions.** Excessive consumption of alcohol and, consequently, the development of LC, can be considered as an adverse factor in the reducing social standard of living. In the majority of people, who died from the decompensation of alcoholic LC, atherosclerotic vascular lesions have been detected. This indicates a significant prevalence of lipid metabolism disturbance in the people with alcoholic LC.

KEY WORDS: liver cirrhosis, alcoholic; cause of death; coronary disease; atherosclerosis.

### Introduction

Demographic processes in Ukraine have signs of a protracted demographic crisis, which is closely related to the historical and socio-economic peculiarities of the country's development. It is well-known that Ukraine belongs to countries with a progressive decline in demographic and reproductive potential, which leads to depopulation and population decline. At the beginning of 2016, the number of children in the population of Ukraine was 16.1 %, those of working age – 61.8 %, older than able-bodied – 22.1 %. The prevalence of women in the elderly as a result of higher mortality among males is the peculiarity of gender imbalance. Demographic aging, that is, the steady increase in the proportion of economically and socially inactive elderly people, combined with a decrease in the proportion of able-bodied people, has a direct impact on various spheres of life in the Ukrainian society [1, 2].

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Along with the aging of the population, the increase in the mortality rate, which is associated with endogenous diseases (circulatory and neoplastic diseases) and exogenous (respiratory diseases, digestive disorders, infectious and parasitic diseases, external) causes, is a topical issue. In recent years, much attention has been paid to the increase in the incidence of so-called non-infectious diseases, which is becoming a sign of not only an epidemic, but also a possible future pandemic [3, 4, 5]. According to the WHO, 41 million people die from these diseases every year, accounting for 71% of all deaths in the world. Annually 15 million people between 30 and 69 years of age die from them. Cardiovascular diseases (stroke, heart attack) and malignant neoplasms are leading in prevalence and mortality among non-infectious diseases [6, 7].

Non-communicable diseases are the result of the combination of genetic, physiological, environmental and behavioural factors. Behavioural factors belong to the modified factors, and they can be changed. These include the use of tobacco, lack of physical activity, inappropriate nutrition, and alcohol abuse. The other not less

important factors include metabolic factors: increased blood pressure, overweight/obesity, hyperglycemia, hyperlipidemia [8, 9, 10].

Among non-infectious diseases caused by these risk factors, the digestive diseases together with the increase of the proportion of deaths are significant. Fibrosis and LC, alcohol and non-alcoholic liver diseases, which accounts for more than 50 % of those who died of digestive diseases, contributed much to mortality from this class of deaths causes. The reasons for this are the continuous increase of quantitative and qualitative types of such patients, frequent chronic diseases, prolonged and severe courses, unfavourable consequences of a disease, prevailing affection of people of working age that is associated with medical and socio-economic factors [11, 12, 13].

The main causes of liver damage are alcohol, viruses, non-alcoholic fatty liver disease. Alcohol is considered to be the main risk factor for adverse lethal outcomes around the world. Alcohol abuse is third among the causes of mortality among young people after tobacco and arterial hypertension and secondarily among the causes of liver transplantation in Europe. In Ukraine, mortality due to ALD takes the second place in the structure of causes of death from digestive diseases [14, 15, 16].

The aim of the research was to study the peculiar features of the death causes in the patients with ALD at the stage of LC based on the analysis of protocols of pathoanatomical investigation.

### Methods

The analysis of 149 protocols of pathoanatomical research of the patients, who died from alcoholic LC at the premises of the Pathoanatomical Department of the Ivano-Frankivsk Regional Clinical Hospital in 2006-2018, was conducted. The average age of patients was (56±12.1) years old (y. o.): women –

(44.6±9.2) y. o., men – (57.6±11.8) y. o., the average duration of the disease was (6.6±1.8) years. The patients were divided into groups by age as follows: 44 young people (31 males and 13 females), 76 middle-aged persons (64 males, 12 females), 29 elderly patients (19 males, 10 females).

### Results

According to the Child-Pugh criteria, among the patients with the LC, who died, there are 9 (6%) persons with stage A of the disease, 26 (17.5%) – with stage B, 114 (76.5%) persons – with stage C. The causes of death in the patients with the LC of alcoholic etiology were pancreatic necrosis (4.7 % of patients with stage A, 8.8 % of patients with stage B and 1.3 % of patients with stage C), gastrointestinal bleeding (GIB) – in 4 % of patients with stage B and in 36.3 % of patients with stage C, liver failure – in 17.4 % of patients with stage C, liver and kidney failure – in 1.3 % of people with stage B and in 10.7 % of persons with stage C, sepsis – in 1.3 % of patients with stage B and in 6.7 % of patients with stage C, cardio-pulmonary insufficiency – in 1.3 % of patients with stage A and 2 % of patients with stage B, HCC – in 4 % of people with stage C (Table 1).

According to the medical records, in all patients who died, the signs of portal hypertension, hepatosplenomegaly, cytolytic, hepatodepressive, mesenchymal-inflammatory syndrome were revealed. Among the manifestations of hepatic hyperazotemia there were hepatic encephalopathy and hepatopulmonary syndrome in all patients and hepatorenal syndrome – in 87.9 % (3.4 %, 10.7 %, 4.7 % of cases in young, middle aged and elderly patients), respectively. The signs of cholestasis syndrome were detected in 88.6 % of patients.

Excessive subcutaneous fat was in 34.9 % of cases, satisfactory – in 42.3 %, insufficient – in 22.8 %. 134 (89.9 %) patients had ascites; 18.1

**Table 1. Death causes in the patients with liver cirrhosis**

Death causes	Stage of Child-Pugh criteria					
	A (n=9)		B (n=26)		C (n=114)	
	n	%	n	%	n	%
Pancreatic necrosis	7	4.7	13	8.8	2	1.3
Gastrointestinal bleeding	-	-	6	4	54	36.3
Liver failure	-	-	-	-	26	17.4
Liver and kidney failure	-	-	2	1.3	16	10.7
Sepsis	-	-	2	1.3	10	6.7
Cardio-pulmonary insufficiency	2	1.3	3	2	-	-
Hepatocellular carcinoma	-	-	-	-	6	4

% of them suffered from ascites-peritonitis. Septicemic condition was revealed in 8.7 % of cases and steatonecrosis of the omentum – in 16.1 % of people. Hydrothorax was diagnosed in 83.2 % of cases, hydropericardium – in all cases. Varicose of the oesophagus veins was diagnosed in all the lethal outcomes: of the 1<sup>st</sup> stage – in 9.4 % (14 persons), 2<sup>nd</sup> stage – in 20.8 % (31 persons), 3<sup>rd</sup> stage – in 69.8 % (104 persons) of cases, varicose veins of the stomach were present in 40.9 % of cases. The bleeding from varicose veins of the oesophagus was in 57.7 %, a combination of bleeding from the veins of the oesophagus and the stomach – in 30.2 % of cases. Depending on the age, the GIB was in 10.7 %, 18.8 %, 6.7 % of the patients of young, middle and old age, respectively. Among men, GIB was revealed in 35.5 % of young people, in 35.9 % of middle-aged patients, in 15.4 % of the elderly. Among women, GIB was revealed in 38.5 % of young people, in 41.7 % of middle-aged patients and 30 % of the elderly (Table 2).

Erosive gastroduodenitis was revealed in 66.4 % (99 persons) of cases, acute ulcers of the duodenal bulb (DB) – in 10.7 % (16 persons), acute ulcers of the stomach – in 2.7 % (4 persons). The umbilical hernia was present in 12.7 % of cases. Chronic hemorrhoids were diagnosed in 10.7 % of people (with bleeding in 4.7 % of cases).

Mild anemia was evidenced in 14.1 % of patients, moderate – in 39.6 %, severe – in 49.7 %. In 86.6 % of cases, the signs of chronic pancreatitis were revealed, 55 % of patients had pancreatic lipodystrophy, 14.8 % suffered from pancreatic necrosis (young and middle-aged persons), 7.4 % had cholelithiasis, 61.7 % – the signs of chronic cholecystitis, in 2 % of people the signs of cholangitis were present. Hypotonia of the gall bladder was revealed in 12.1 % of all cases.

Type 1 diabetes mellitus was diagnosed in 2 % of young people, type 2 – in 4.7 % of middle-aged and elderly people. Chronic pyelonephritis

**Table 2. The revealed pathoanatomical changes of internal organs depending on the liver cirrhosis decompensation stage**

Pathological changes of internal organs	Stage by Child-Pugh criteria					
	A		B		C	
	n	%	n	%	n	%
	9	6	26	17.5	114	76.5
Cardiovascular system:						
- hydropericardium	9	6	26	17.5	114	76.5
- hypertension	6	4	8	5.4	2	1.3
- IHD	3	2	22	14.8	31	20.8
- atrial fibrillation	-	-	3	2	2	1.3
- ischemic stroke of the brain in anamnesis	3	2	6	4	-	-
- chronic venous insufficiency of the vessels of the lower extremities	-	-	-	-	7	4.7
- atherosclerosis of the coronary arteries	9	6	24	16.1	22	14.8
-- stage of the lipid stain	2	1.3	10	6.7	5	3.4
-- stage of atherosclerotic plaque	5	3.4	10	6.7	17	11.5
-- complicated plaque with ulceration	-	-	4	2.7	-	-
-- narrowing of LCA by 10%	3	2	3	2	2	1.3
-- narrowing of LCA by 30%	3	2	2	1.3	2	1.3
-- narrowing of LCA by 50%	-	-	3	2	-	-
- atherosclerosis of the iliac arteries	4	2.7	8	5.3	5	3.4
-- stage of the lipid stain	-	-	6	4	5	3.4
-- stage of atherosclerotic plaque	4	2.7	2	1.3	-	-
- atherosclerotic changes in the aorta	9	6	26	17.5	84	56.4
-- stage of the lipid stain	2	1.3	9	6	36	24.2
-- stage of atherosclerotic plaque	4	2.7	12	8	42	28.2
-- complicated plaque with ulceration	3	2	5	3.4	6	4
Respiratory system:						
- hydrothorax	-	-	10	6.7	114	76.5
- pulmonary edema	9	6	26	17.5	114	76.5
- pulmonary emphysema	-	-	2	1.3	4	2.7
- pneumonia	-	-	7	4.7	98	65.8
- pleurisy	-	-	6	4	35	23.5
- CORP	-	-	3	2	8	5.4

Pathological changes of internal organs	Stage by Child-Pugh criteria					
	A		B		C	
	n	%	n	%	n	%
	9	6	26	17.5	114	76.5
Digestive system:						
- portal hypertension	9	6	26	17.5	114	76.5
- cytolytic syndrome	9	6	26	17.5	114	76.5
- hepatodepressive syndrome	9	6	26	17.5	114	76.5
- mesenchymal-inflammatory syndrome	9	6	26	17.5	114	76.5
- cholestasis syndrome	-	-	18	12.1	114	87.9
- ascites	-	-	20	13.4	114	86.6
- ascites-peritonitis	-	-	-	-	27	18.1
- steatonecrosis of the omentum	-	-	-	-	24	16.1
- splenomegaly	9	6	26	17.5	114	76.5
- umbilical hernia	-	-	-	-	19	12.7
- varicose of the esophagus veins	9	6	26	17.5	114	76.5
1-st degree	9	6	5	3,4	-	-
2-nd degree	-	-	21	14.1	10	6.7
3-d degree	-	-	-	-	104	69.8
-- with bleeding	-	-	-	-	86	57.7
- varicose veins of the stomach	-	-	-	-	61	40.9
-- with bleeding	-	-	-	-	45	30.2
- erosive gastroduodenitis	-	-	8	5.3	91	61.1
- acute ulcers of the duodenal bulb	-	-	-	-	16	10.7
- acute ulcers of the stomach	-	-	-	-	4	2.7
- chronic hemorrhoids	-	-	3	2	13	8.7
- hemorrhoidal bleeding	-	-	-	-	7	4.7
- chronic pancreatitis	-	-	15	10.1	114	76.5
- pancreatic lipodystrophy	-	-	6	4	76	51
- pancreatic necrosis	10	6.7	8	5.4	4	2.7
- cholelithiasis	2	1.3	5	3.4	4	2.7
- chronic cholecystitis	-	-	16	10.7	76	51
- cholangitis	-	-	-	-	3	2
- hypotonia of the gall bladder	-	-	-	-	18	12.1
- type 1 diabetes mellitus	-	-	-	-	3	2
- type 2 diabetes mellitus	-	-	2	1.3	5	3.4
Urinary system:						
- chronic pyelonephritis	-	-	2	1.3	12	8.1
- kidney cyst	-	-	-	-	3	2
Nervous system:						
- encephalopathy	9	6	26	17.5	114	76.5
- alcoholic delirium in anamnesis	7	4.7	4	2.7	-	-

was present in 9.4 % of cases, kidney cyst – in 2 %.

Pneumonia was diagnosed in 70.5 %, pleurisy – in 27.5 %, chronic obstructive pulmonary disease (COPD) – in 7.4 %, pulmonary emphysema – in 4 %. In 4.7 %, chronic venous insufficiency of the vessels of the lower extremities was revealed.

Among the concomitant diseases, hypertension was present in 10.7 % of middle aged and elderly patients, ischemic heart disease (IHD) – in 37.6 % of cases, 3.4 % of these patients suffered from atrial fibrillation. 6 % of patients had ischemic stroke of the brain in anamnesis, and 7.4 % – alcoholic delirium. The signs of atherosclerosis were also evidenced. Particu-

larly, the biochemical parameters of the lipid spectrum were characterized by an increase in the content of total cholesterol in the blood, low and very low-density lipoprotein cholesterol. Moreover, the degree of increase of these indicators was directly proportional to the degree of decompensation of LC.

Atherosclerotic changes in the aorta at the stage of lipid stain were present in 31.5 % of cases, at the stage of atherosclerotic plaque – in 38.9 %, at the stage of complicated plaque with ulceration – in 9.4 % of people. Atherosclerosis of the left coronary artery (LCA) was revealed in 11.4 % at the lipid staining stage, at the stage of atherosclerotic plaque – in 21.5 %, ulcerated atherosclerotic plaque was present in 2.7 %.

Narrowing of LCA by 10% was revealed in 5.3 % of cases, by 30 % – in 4.7 %, by 50 % – in 2 %. Atherosclerosis of iliac arteries was present in 11.4 % of patients.

### Discussion

Consequently, analyzing clinical records of the pathoanatomical study of the patients with alcoholic LC, it was established that most patients were young and middle aged and died from decompensated LC with the development of multiple organ failure. In all cases, there was a lesion of the pancreas, in half of them lipodystrophy was revealed. Bleeding from varicose veins of the esophagus and stomach was the cause of death in 57.5 % of people, 14.8 % of patients died from pancreatic necrosis, 4 % – from HCC. IHD was the concomitant illness in 37.6 % of the patients. More than 70 % of the dead had atherosclerotic lesions of aorta, and one third of the persons had injured coronary vessels.

Excessive consumption of alcohol and, consequently, the development of LC, can be considered as an adverse factor in the reducing social standard of living. Fatal cases were caused by decompensation of LC, development of multiple organ failure, pancreatic necrosis, bleeding from the esophagus and stomach veins, HCC. Special attention should be paid to the combination of ALD with atherosclerotic vascular changes revealed in 79.8 % of people, indicating a significant prevalence of lipid metabolism disorders among people with decompensated alcoholic LC.

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pensation of LC, 4 % of patients died from HCC. Cardio-pulmonary failure caused death in the patients with compensation and subcompensation of LC.

The cytolytic, hepato-depressive, mesenchymal-inflammatory, hepatic encephalopathy, cholestatic, hepatorenal, anemic, hepatopulmonary syndromes and portal hypertension were especially significant in the patient with subcompensation and decompensation of LC.

More than a third of people had overdeveloped subcutaneous fat. IHD was the concomitant illness in 37.6 % of the patients. More than 70 % of the dead had atherosclerotic lesions of aorta, and one third of the persons had injured coronary vessels.

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### Conclusions

Analyzing clinical records of the pathoanatomical study of the patients with alcoholic liver cirrhosis, it was established that most patients were young and middle aged and died from decompensated LC with the development of multiple organ failure. Bleeding from varicose veins of the esophagus and stomach were the causes of death in 57.5 % of people, 14.8 % of patients died from pancreatic necrosis, 4 %– from HCC. IHD was the concomitant illness in 37.6 % of the patients. More than 70% of the dead had atherosclerotic lesions of aorta, and one third of the persons had injured coronary vessels. Pancreatic necrosis and cardio-pulmonary failure were the causes of death in most people with stages A and B. GIB, hepatic and hepatic-renal failure, sepsis, and development of HCC were the causes of death in most people with stage C. IHD was the concomitant illness in 37.6 % of the patients.

### Conflict of interest

The author declares no conflict of interest.



# АНАЛІЗ СМЕРТНОСТІ ХВОРИХ НА АЛКОГОЛЬНИЙ ЦИРОЗ ПЕЧІНКИ

Н.Р. Матковська

ДВНЗ "ІВАНО-ФРАНКІВСЬКИЙ НАЦІОНАЛЬНИЙ МЕДИЧНИЙ УНІВЕРСИТЕТ",  
ІВАНО-ФРАНКІВСЬК, УКРАЇНА

**Вступ.** Алкоголь визнають основним фактором ризику несприятливих летальних завершень у всьому світі. В Україні смертність внаслідок алкогольної хвороби печінки (АХП) посіла друге місце в структурі причин смерті від хвороб органів травлення.

**Мета.** Метою було вивчити особливості причин смерті у осіб з АХП на стадії цирозу печінки (ЦП) на основі аналізу протоколів патологоанатомічного дослідження.

**Методи.** Проведено аналіз 149 протоколів патологоанатомічного дослідження померлих на алкогольний ЦП на базі патологоанатомічного відділення Івано-Франківської обласної клінічної лікарні за період 2006-2018 рр.

**Результати.** Більшість осіб були молодого та середнього віку. Летальні випадки були зумовлені декомпенсацією ЦП з розвитком печінкової, печінково-ниркової, серцево-легеневої недостатності, панкреонекрозу, шлунково-кишкових кровотеч, сепсису, гепатоцелюлярної карциноми. У 37,6% померлих супутньою хворобою була ішемічна хвороба серця, у 10,7% осіб – гіпертонічна хвороба. У 6% осіб в анамнезі був перенесений ішемічний інсульт головного мозку. У більшості осіб виявлено атеросклеротичні зміни судин.

**Висновки.** Надмірне вживання алкоголю і, як наслідок, розвиток цирозу печінки можна вважати несприятливим чинником зниження рівня здоров'я населення. У більшості осіб, що померли внаслідок декомпенсації алкогольного виявлено атеросклеротичні ураження судин. Це вказує на значну поширеність порушення ліпідного обміну у осіб з алкогольним цирозом печінки.

**КЛЮЧОВІ СЛОВА:** алкогольний цироз печінки; причини смерті; ішемічна хвороба серця; атеросклероз.

## Інформація про автора

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