DOI 10.24144/2077-6594.3.1.2021.240803
УДК 616.36-008.6-056.52:364.4-058.51

Belovičová M., Popovičová M.

Fatty liver disease in social reintegration facilities clients

St. Elizabeth University of Health and Social Sciences, Bratislava, Slovak Republic

mriab9@gmail.com, majapopovicova7361@gmail.com

Беловічова М., Поповічева М.
Жирова хвороба печінки у клієнтів закладів соціальної реінтеграції
Вища школа охорони здоров'я та соціальної роботи Св. Алжбети, м. Братислава, Словаччина

Беловичова М., Поповичева М.
Жировая болезнь печени у клиентов учреждений социальной реинтеграции
Высшая школа здравоохранения и социальной работы Св. Елизаветы, г. Братислава, Словакия

Introduction

NAFLD – Non-Alcoholic Fatty Liver Disease – is characterized by the presence of liver steatosis, i. e. excessive accumulation of fat in liver tissue (steatosis must be present in more than 5% of hepatocytes), which is associated with insulin resistance. NAFLD is considered a benign, non-progressive form of the disease, while NASH – Non-Alcoholic Steatohepatitis – is a progressive form with the development of fibrogenesis, with a high risk of liver cirrhosis and hepatocellular carcinoma of the liver [1].

NAFLD is the most common liver disease in economically developed countries. The prevalence ranges from 17 to 46% depending on diagnostic procedures, ethnicity, age, gender [2]. In children, the prevalence of NAFLD is related to the age of the child: 3-10%, but in obese children it reaches a value of 40-70% [3].

In Europe, in 2016, 73 million people suffered from NAFLD, out of which 2.5 million suffered from advanced fibrosis. By 2030, the NAFLD can be expected to increase to 84 million. The alarming assumption is that by 2030, in Europe, the number of people suffering from advanced fibrosis will double – from 2.5 million to 5 million [4].

The prevalence of NAFLD increases with age as older patients have more risk factors for metabolic syndrome [2]. It is generally believed that the progression of NAFLD to steatohepatitis or to fibrosis results rather from associated diseases and their duration than from the age itself. Risk factors for the development of NAFLD are: obesity, type 2 diabetes mellitus (DM), hypertriglyceridemia [5–7].

Characteristics of the sample

The project "Screening of liver diseases in social reintegration facility" ran from 1/2020 to 10/2020. It was carried out within the institutional project of the St. Elizabeth University of Health and Social Sciences (VŠZaSP sv. Alžbety) and the Slovak Society of Practical Obesitology (SSPO).

We examined a total of 229 clients and employees in the social reintegration facility of the Institute of Christ the High Priest in Žakovce: 188 clients (82%) and 41 employees (18%). Males made up 63% of the sample (145), females 37% (84). The average age of clients in Žakovce was 51.4 years, the average length of stay in the facility was 5.87 years. We determined the nutritional status of clients by determining their BMI: 95 clients (including employees) had physiological weight (41.4%), 69 were overweight (30.1% of the sample), 34 were obese (14.8%), 7 clients suffered from malnutrition (3%).

Methodology

At the beginning we clinically examined all the clients and employees interested in the examination. We took a medical history (what diseases clients are being treated for, what medications they take, whether they are allergic to any medications or food).

In addition to anamnestic data, we asked the clients / employees about the length of their stay in the facility, we determined their height, weight, waist circumference. We also collected venous blood. Due to the larger number of clients and employees, we visited the facility in Žakovce a total of 20 times.

We examined following biochemical parameters of clients´ and employees´ venous blood samples: fat spectrum (cholesterol, LDL-cholesterol, HDL-cholesterol, triacylglycerols), so-called liver function tests (AST, ALT, GGT, ALP), albumin, bilirubin, glycemia, creatinine, levels of vitamin D and of folic acid. Out of the capillary blood we examined the level of ammonia (NH3).

To examine the stiffness of the liver tissue we used transient elastography (TE). It is a non-invasive painless method that measures the liver stiffnes. We used special software to quantify the presence of steatosis (a so-called CAP module – controlled attenuation parameter).

The aim of the research was: a) to find a correlation between the degree of fibrosis and the degree of CAP; b) determination of the correlation between NH3 indicators and

the fat spectrum (CHOL, TAG, LDL, HDL); c) determination of the correlation between the NH3 level and the CAP level.

Results

We investigated whether there was a correlation between the degree of fibrosis and the degree of CAP. According to the Cohen scale (Pearson = 0.137) the correlation between CAP values and Fibroscan values was weak. The results are shown in table.

On the CAP module, we distinguish the degrees of hepatic steatosis according to the percentage of liver impairment as follows: S0 (0–10% of hepatic steatosis), S1 (11–33%), S2 (34–66%), S3 (67–100%).

In our cohort: 42/99 patients had steatosis grade 0 (42.4%), 23/99 had steatosis grade 1 (23.2%), 11/99 had steatosis grade 2 (11.1%), 23/99 had steatosis grade 3 (23.2%).

Table. **Correlation between the degree of fibrosis and the degree of CAP**

Correlations			
		CAP	**Fibroscan**
CAP	**Pearson Correlation**	**1**	**,137**
	Sig. (2-tailed)		**,179**
	N	**99**	**98**

On a device from the ARKRAY company, using the microdiffusion method, out of a drop of capillary blood we determined the ammonia level in 194/229 clients (85% of the group) at the Institute of Christ the High Priest (IKV) in Žakovec. The average level of NH3 in clients, but also in employees, was 181.8 μmol/l.

In our research, we set several goals associated with the level of NH3. One of them was: to find out whether there is a correlation between ammonia level (NH3) and fat spectrum indicators (CHOL, TAG, LDL, HLD).

At the same time, we analyzed the individual parameters of the fat spectrum. We found an increased level of cholesterol in 106/221 clients (47.9%), 100/225 clients (46.4%) had an increased level of triacylglycerides (TAG), we found an increased level of LDL in 132/190 patients (69.4%), a decreased level of HDL was found in 72/191 clients (37.7%).

On the whole, we can state that dyslipoproteinemia was very common in the clients, which is a risk factor not only for fatty liver disease but also for cardiovascular diseases.

Another goal was to determine possible correlations between the level of NH3 and the degree of CAP. According to the Cohen scale (Pearson = 0.083) the correlation between NH3 and CAP was trivial / (negligible).

Discussion

In the group of examined clients and employees of the social reintegration facility in Žakovce, we were mainly looking for the presence of liver diseases (with a focus on NAFLD). During the examination of the clients we found not only frequent occurrence of dyslipoproteinemia, but also of other diseases of civilization.

The aim of the treatment of patients diagnosed with NAFLD/NASH is to slow down or to stop the progression of the disease and the development of liver fibrosis/cirrhosis and subsequent serious complications [8].

Epidemiological studies confirm a correlation between the incidence of NAFLD and unhealthy lifestyle [1]. The treatment strategy for NAFLD is mostly based on regimen measures and treatment of individual components of the metabolic syndrome [9]. For morbidly obese patients, bariatric surgery is a suitable alternative. A thorough treatment of the present risk factors is required.

Rational eating is taking on a new dimension in the context of the COVID-19 pandemic. It has become a global health and social problem with specific contexts in the field of gastroenterology and hepatology. There is a correlation between COVID-19 infection and NAFLD [10].

Physical activity is important not only in the treatment of NAFLD, but also in its primary prevention. Physical activity supports the production of active body mass, prevents undesired reduction of muscle mass during a reduction diet. It also reduces diet-induced decrease in resting energy expenditure, favorably affects the amount of postprandial energy expenditure and it increases the mobilization of fats from fat stores.

As important as the exercise itself is the limitation of the sedentary way of spending free time outside of the exercise. Sedentary lifestyle and low cardiorespiratory fitness are among the most important independent predictors of premature mortality.

Conclusions

NAFLD is considered to be a slowly progressing chronic liver disease in both adults and children. Over the last 30 years, NASH has become a serious health problem due to the obesity epidemic and metabolic syndrome. NAFLD/NASH is considered to be an organ/liver manifestation of the metabolic syndrome, and is likely to play a key role in the pathogenesis of systemic atherosclerosis.

Besides taking care of our outpatient clinics patients, we should not forget about clients of the social reintegration facilities, in whom due to the presence of several risk factors (including stress and difficult life circumstances that brought them to such facility), the incidence of liver diseases and other diseases of civilization is even higher compared to the general population.

References

1. Holomáň, J., Szántová, M., Zima, M., Slobodová, Ľ. Management of non – alcoholic fatty liver disease. Via pract., 2016, 13(5): 179 -186**.** ISSN 1339-424X (Online).
2. Vernon, G., Baranova, A., Younossi, ZM.. Systematic review: the epidemiology and natural history of non-alcoholic fatty liver disease and non-alcoholic steatohepatitis in adults. Aliment Pharmacol Ter. 2011; 34: 274-285.ISSN:1365-2036 (Online).
3. Leite, NC., Villea-Nogueria, CA., Cardoso, CRL., Salles, GF. Non-alcoholic fatty liver disease and diabetes. From pathophysiological interplay to diagnosis and treatment. WJG. 2014; 14: 8377/8392. ISSN 2219-2840 (online).
4. Dražilová, S. Non-alcoholic fatty liver disease. p. 249.265. In: Dražilová, S., Gombošová, L., Janíčko, M., Skladaný, Ľ., Veselíny, E. Selected chapters from hepatology gastroenterology. Košice: UPJŠ LF, 2020, 284 p. ISBN 978-80-8152-838-5 (e-publication)
5. EASL-EAS-EASO Clinical Practice Guidelines: For the management of Non-Alcoholic Fatty Liver Disease. J Hep.2016; http://dx.doi.org/10.2016/j.jhep. 2015.11.004.
6. Belovičová, M. Selected liver diseases and their impact on public health. Bardejov: SSPO, 2018, p. 159. ISBN 978-80-971460-6-1.
7. Belovičová, M. Non-alcoholic fatty liver disease and its impact on public health. Krakow: Towarzystwo Slowakow w Polsce, 2019, p. 96. ISBN 978-83-8111-142-3.
8. Holomáň, J., Szántová, M., Zima, M., Koller, T., Fábryová, Ľ. Non-alcoholic fatty liver disease – standard diagnostic and therapeutic procedure. 63. Methodical sheet of rational pharmacotherapy.2017; 20 (1-2).
9. Belovičová, M., Mašterová, V. Non-alcoholic fatty liver disease – severe comorbidity of diabetes. Forum Diab 2016; 5(1): 45-48. ISSN 1805–3807.
10. Špičák, J. Covid-19 a hepatogastroenterologie. Gastroent Hepatol 2020; 74(5): 415-423. ISSN 1804-7874.

Дата надходження рукопису до редакції: 14.09.2021 р.

NAFLD (Non-alcoholic fatty liver disease) is characterized by the presence of hepatic steatosis, i. e. excessive accumulation of fat in liver tissue that is associated with insulin resistance. NAFLD/NASH is considered to be an organ/liver manifestation of the metabolic syndrome, and is likely to play a key role in the pathogenesis of systemic atherosclerosis. The project "Screening of liver diseases in social reintegration facility" ran from 1/2020 to 10/2020. It was carried out within the institutional project of the St. Elizabeth University of Health and Social Sciences (VŠZaSP sv. Alžbety) and the Slovak Society of Practical Obesitology (SSPO) at the Institute of Christ the High Priest in Žakovce.

The aim of the research was: a) to find a correlation between the degree of fibrosis and the degree of CAP; b) to determine the correlation between NH3 and fat spectrum indicators (CHOL, TAG, LDL, HDL); c) to determine the correlation between the NH3 level and the CAP level. The author evaluates individual results of the projects in the article. Besides taking care of our outpatient clinics patients, we should not forget about clients of the social reintegration facilities, in whom due to the presence of several risk factors, the incidence of liver diseases and other diseases of civilization is even higher compared to the general population.

Key words: NAFLD – Non-alcoholic fatty liver disease, liver diseases, social reintegration facility.

Неалкогольна жирова хвороба печінки (НАЖХП) характеризується наявністю жирового гепатозу, тобто надмірного накопичення жиру в тканинах печінки, пов'язаного з інсулінорезистентністю. НАЖХП вважається проявом метаболічного синдрому органу/печінки, він може відіграти ключову роль у патогенезі системного атеросклерозу. Проєкт «Скринінг захворювань печінки в установі соціальної реінтеграції» проводився з 1/2020 по 10/2020. Він здійснювався в рамках інституційного проєкту Університету здоров'я та соціальних наук Святої Єлизавети і Словацької спільноти практичного ожиріння при Інституті Христа Первосвященника в Жаковце.

Метою дослідження було: а) знайти взаємозв'язок між ступенем фіброзу та ступенем стеатозу; в) визначити взаємозв'язок між рівнем NH3 та індикаторами жирового спектру (CHOL, TAG, LDL, HDL); с) визначити взаємозв'язок між рівнем NH3 та рівнем стеатозу. У статті автор оцінює індивідуальні результати проєктів. Крім догляду за пацієнтами в поліклініках, не слід забувати про клієнтів в установах соціальної реінтеграції, у яких через наявність декількох факторів ризику поширеність хвороб печінки та інших хвороб цивілізації є навіть вищою порівняно із усім населенням.

Ключові слова: неалкогольна жирова хвороба печінки, захворювання печінки, установа соціальної реінтеграції.

Неалкогольная жировая болезнь печени (НАЖБП) характеризуется наличием жирового гепатоза, то есть чрезмерного накопления жира в тканях печени, связанного с инсулинорезистентностью. НАЖХП считается проявлением метаболического синдрома органа/печени, он может сыграть ключевую роль в патогенезе системного атеросклероза. Проект «Скрининг заболеваний печени в учреждении социальной реинтеграции» проводился с 1/2020

по 10/2020. Он осуществлялся в рамках институционального проэкта Университета здоровья и социальных наук Святой Елизаветы и Словацкой сообщества практического ожирение при Институте Христа Первосвященника в Жаковце.

Целью исследования было: а) найти взаимосвязь между степенью фиброза и степенью стеатоза; в) определить взаимосвязь между уровнем NH3 и индикаторами жирового спектра (CHOL, TAG, LDL, HDL) с) определить взаимосвязь между уровнем NH3 и уровнем стеатоза. В статье авторы оценивают индивидуальные результаты проектов. Помимо ухода за пациентами в поликлиниках, не следует забывать о клиентах в учреждениях социальной реинтеграции, в которых из-за наличия нескольких факторов риска распространенность болезней печени и других болезней цивилизации является даже выше по сравнению со всем населением.

Ключевые слова: неалкогольная жировая болезнь печени, заболевания печени, учреждение социальной реинтеграции.

Conflicts of interest: authors have no conflicts of interest.

Відомості про авторів

Assoc. Prof. **Mária Belovičová**, MD. PhD. – St. Elizabeth University of Health and Social Sciences, Bratislava, Internal Clinic for Liver Disease Diagnosis and Treatment, Remedium s.r.o. Bardejov Spa, Slovak Society of Practical Obesitology (SSPO), Bardejov.
mriab9@gmail.com.

Assoc. Prof. PhDr. **Mária Popovičová**, PhD. – St. Elizabeth University of Health and Social Sciences, Bratislava - teacher St. Elizabeth University of Health and Social Sciences, Bratislava, Námestie 1. mája 1, 811 02 Bratislava.
majapopovicova7361@gmail.com.