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Research Article

Prevalence of Non-Alcoholic Fatty Liver Disease (NAFLD) based on Abdominal Ultrasound and Its Risk Factors in Nangarhar University Teaching Hospital

Rahmatzai Nasseemullah[1], Hadi Naqeebullah[2], Hashimi Sayed Azizullah[1], Hadi Saifullah[3]*, Sherzai Aimal[3]

[1] Department of Radiology, Nangarhar University Teaching Hospital, Jalalabad, Afghanistan
[2] Department of Surgery, Nangarhar University Teaching Hospital, Jalalabad, Afghanistan
[3] Department of Internal Medicine, Nangarhar University Teaching Hospital, Jalalabad, Afghanistan

Corresponding Author: Hadi Saifullah*

Abstract

BACKGROUND: Non-alcoholic fatty liver disease (NAFLD) is one of the major liver diseases that disrupts the functioning of the liver and is a dangerous condition that can be a direct cause of death. Because the prevalence and risk factors of NAFLD were not known at the Nangarhar University teaching Hospital, our aimed is to determine the prevalence of NAFLD based on abdominal ultrasound and its risk factors, including obesity, diabetes mellitus (DM), hypertension, age and hyperlipidemia in Nangarhar University Teaching Hospital.

METHOD: This is a cross-sectional study, which ran from 1/1/2023 to 30/7 /2023. In this study, all patients (men and women) who had NAFLD and those who had risk factors such as age, obesity, hypertension, diabetes mellitus, and blood lipid disorders such as hypertriglyceridemia and hypercholesterolemia were included. Our research started this way: when the patients were referred for abdominal ultrasound examination and their examination revealed a fatty liver with the presence of characteristic sonographic findings. The patients with a history of Alcohol drinking we're not allowed to participate in the study. Our study used non-probability purposive sampling. Permission from the patients to participate in the study was first acquired, and the Trained Doctor then completed the questionnaire we created. The Teaching Hospital offers free abdominal ultrasonography examinations, blood tests (including blood lipid and blood sugar), and patient weight measurements. An abdominal ultrasonography machine, patient files, a Sphygmomanometer, blood lipids, and sugar levels were among the supplies needed to complete the study. SPSS and Excel are used to examine research data.

RESULT: 2,397 people—1,471 women and 926 men—referred for abdominal ultrasound exams at Nangarhar University Teaching Hospital's Radiology Department. hundreds of them had fatty livers. overall prevalence of NAFLD was 4.21%. NAFLD was more common in people over 40 (66%) and in people 40-20 (45.31%). Of the NAFLD patients, 35% had normal blood pressure and 63% had hypertension. 24(15%) of NAFLD patients were no obesity, while 84% of patients had obesity. Diabetics made up 43% of NAFL patients. Twenty percent of NAFLD patients had Hypercholesterolemia, and sixty percent of NAFL patients had hypertriglyceridemia. and Grade I fatty livers were present in every NAFLD patient. prevalence ratio of NAFLD was 2.83% in female and 1.33% in male

CONCLUSION: NAFLD is more common in women than men, and the incidence of NAFLD is also high in patients who had risk factors such as obesity, hypertension, and diabetes, and the population is over 40 years old.

KEYWORDS: Abdominal Ultrasound, Blood Lipids, DM, Gender, Hypertension, NAFLD, Obesity

INTRODUCTION

Simple steatosis, non-alcoholic statin Pathy (NASH), and syndrome are all forms of non-alcoholic fatty liver disease (NAFLD). It is linked to higher insulin resistance and a greater likelihood of cardiovascular disease, and it is a major cause of liver-related death. NAFLD affects an important fraction of individuals with metabolic syndrome and type 2 diabetes. It may also develop into cancer. In developed countries, nonalcoholic fatty liver disease (NAFLD) is now the most frequent cause of liver dysfunction; this tendency is expected to continue at home in emerging nations. In Western nations, the incidence of NAFLD will range from 20 to 30 percent during the next few decades. Pollution rates in the Middle East, Japan, and China range from 15 to 30 percent, which is similar to those in the West. (Alam,2018). In this research, which was cross-sectional and conducted in Korea, the total number of patients who underwent ultrasound was 6648. All patients were over 20 years old; 3530 were men and 3118 were women. They had no alcohol history and no viral hepatitis. It was seen that the risk factors for NAFLD were obesity, insulin resistance, hyperlipidemia, and hyperglycemia in both genders, as well as age, menopausal status, and estrogen medication in women only. In this study, the incidence of NAFLD was high in obese patients. (Park,2006).

The worldwide epidemiology of obesity and type 2 diabetes is leading to the largest non-alcoholic fatty liver disease (NAFLD) outbreak in the world. A recent report found that 25 percent of the world's population has NAFLD, and up to 30 percent in Korea. Based on the prevalence of obesity and type 2 DM, it is believed that NAFLD prevalence is on the rise as people live westernized lifestyles, and the number of NAFLD patients is increasing. (Huh,2022).

NAFLD is one of the most important symptoms of chronic hepatic disease. The severity of NAFLD ranges from simple NAFLD to nonalcoholic steatohepatitis (NASH), liver cirrhosis, and progression to hepatocellular carcinoma. (HCC).(Huh,2022) . NAFLD disease is characterized by various factors, including genetic, type 2 diabetes mellitus, metabolic syndrome, and environmental factors. The NAFLD does not have a definite treatment. (Huh, Y,2022). The incidence and prevalence of NAFLD in the world are increasing day by day. A cohort study in 1997, which found NAFLD in 62 per 100,000 people according to age and sex in America, also found that in 2014, 329 people had NAFLD per 100,000 people. A meta-analysis study in Asia shows that between 1989 and 2015, the number of NAFLDs was 52.34 per 1,000 years. In Israel, it was 28.01 per 1,000 person-years. In Asia, from 1999 to 2019, the number of NAFLDs was 50.9 per 1,000 person-years. In South Korea, it was 45.1 per 1,000 person-years. (Huh,2022)

Men are typically more likely than women to have NAFLD. Men with NAFLD are more likely to have it when they are middle-aged compared to when they are older than 50. Before the age of 50, the incidence is lower in women. It rises after menopause and peaks at age 60. 28, 29 Compared to premenopausal women, men are more likely to develop more severe liver fibrosis. Nonetheless, postmenopausal women are equally likely as men to develop severe liver fibrosis, indicating that estrogen may prevent fibrogenesis. As people age, the prevalence of risk factors like metabolic syndrome, type 2 diabetes, and hypertension also grows, increasing the chance of non-alcoholic fatty liver disease (NAFLD). (Huh,2022)

Nonalcoholic fatty liver refers to hepatic steatosis, which has hepatocellular injury but is not the form of fibrosis and ballooning, and NASH refers to a condition in which hepatic steatosis is present and hepatocellular injury (ballooning) is accompanied by fibrosis or not. Risk factors in Asian countries are obesity, dyslipidemia, type 2 diabetes, and metabolic syndrome; in Western countries, other factors are hypothyroidism, polycystic ovary syndrome, obstructive sleep apnea, hypopituitarism, and hypogonadism. (Duseja, 2013)

Bedside ultrasound is an initial non-invasive liver examination that provides information about NAFLD within a 20-minute period, and clinical doctors should always use this examination to diagnose the beginning of asymptomatic liver diseases. Ultrasounds also determine the prevalence of fatty liver disease. (Khov,2014)

Because the data on the prevalence of fatty liver disease is not available in Nangarhar University Teaching Hospital, it was necessary to investigate the prevalence of nonalcoholic fatty liver disease (NAFLD) and its risk factors and which risk factors are more prevalent. So serious measures should be taken to prevent the development of fatty liver disease and its outcomes, such as steatohepatitis, liver cirrhosis and liver carcinoma. Our goal was to find out how common Non-Alcoholic Fatty Liver disease (NAFLD) was in Nangarhar University Teaching Hospital based on abdominal ultrasound results and risk variables such as age, hyperlipidemia, diabetes, obesity, and hypertension.

MATERIALS AND METHODS

The purpose of this research is to determine the prevalence of non-alcoholic fatty liver disease according to abdominal ultrasound and to determine the risk factors of non-alcoholic fatty liver disease, such as obesity, diabetes, hypertension, gender, age, and lipid disorders. This was a cross-sectional study conducted from 1/1//2023 to 30/7/2023, there were 2,397 individuals who referred to the Radiology Department of Nangarhar University Teaching Hospital for abdominal ultrasound examinations, of which 1,471 were women and 926 were men. Among them, 100 patients had fatty livers, of which 66(66%) were women and 34(34%) were men. The beginning of our research was like this: when the patients referred for abdominal ultrasound examination and their abdominal ultrasound examination had fatty liver(ultrasound based diagnosis of fatty liver study Because ultrasound is a non-invasive method of diagnosing NAFLD with the presence of characteristic sonographic findings), We studied these patients as a gender (female and male), age, diabetes mellitus, blood pressure, weight, and blood lipid abnormalities such as cholesterol and triglycerides. the patients who had alcohol consumption were excluded from the study. The sampling of our research was non-probability purposive, that is, all patients who met the criteria of our research were included. At the beginning of the research, permission was obtained from the patients to

Participate in the study and then the questionnaire that we made was filled out by the trained doctor. In this questionnaire, the indicators considered are gender (male and female), age, diabetes mellitus, blood pressure, blood lipids (cholesterol and triglycerides), and obesity. Abdominal ultrasound examinations, blood examinations such as blood sugar, blood lipids, and weight of patients are performed free of charge in the Nangarhar University Teaching Hospital, and the patients are not charged any expenses. Our data collection was through the patients' files, laboratories, and information in the form of interviews about having hypertension, diabetes, and previous laboratory examinations, such as sugar, blood lipids, height, and weight measurements of patients. The materials that were used to complete the research were an abdominal ultrasound machine,

history, blood tests such as blood sugar, blood lipids, and blood pressure scales. Research data is analysed by Excel and SPSS.

RESULTS

The overall prevalence of NAFLD was 4.21%. The prevalence of NAFLD was 66% over 40 years old and 45.31 in % 20-40 years old. 63% of NAFLD patients had hypertension, and 35% had normal blood pressure. 84% of NAFLD patients had obesity, and 15% had no obesity. 43% of NAFLD patients had diabetes. 60% of NAFLD patients had hypertriglyceridemia, 20% of NAFLD patients had hypercholesterolemia, and all NAFLD patients had Grade I fatty Liver. The prevalence ratio of NAFLD was 2.83% in females and 1.33% in males

Table 1: Statistics of exposed and non-exposed outcomes of NAFLD

Variables	Odd ratio	95% CI	Z statistic	Significance level
Age	4.3203	2.3896 to 7.8122	4.843	$P<0.0001$
Hypertension	3.1622	1.7747 to 5.6344	3.906	$P=0.0001$
Obesity	29.7500	13.8264 to 64.0124	8.679	$P<0.0001$
Diabetes Mellitus	0.6064	0.3988 to 1.2159	1.273	$P=0.2031$
Hypertriglyceridemia	6.0000	3.1873 to 11.2948	5.552	$P<0.0001$

In this table, it can be seen that the prevalence of NAFLD is high in obese patients, hypertriglyceridemia and aged individuals, and hypertension.

DISCUSSION

NAFLD was more common in people over 40 (66%) and in people 20-40 (45.31%). Of the NAFLD patients, 35% had normal blood pressure and 63% had hypertension. 15% of NAFLD patients had obesity, while 84% of patients had no obesity. Diabetics made up 43% of NAFLD patients. Twenty percent of NAFLD patients had hypercholesterolemia, sixty percent of them had hypertriglyceridemia, and all of them had Grade I fatty livers. The NAFLD's gender ratio of men to women differed by 32%.2.75344% of female NAFLDs overall. Male NAFLD prevalence overall is 1.418%. A research study, which was conducted in Korea, the total number of patients who underwent ultrasound was 6648. All patients were over 20 years old; 3530 were men and 3118 were women. They had no alcohol history and no viral hepatitis. It was seen that the risk factors for NAFLD were obesity, insulin resistance, hyperlipidemia, and hyperglycemia in both genders, as well as age, menopausal status, and estrogen medication in women only. In this study, the incidence of NAFLD was high in obese patients. (Park,2006).

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America also found that in 2014, 329 people had NAFLD per 100,000 people. A meta-analysis study in Asia shows that between 1989 and 2015, the number of NAFLDs was 52.34 per 1,000 years. In Israel, it was 28.01 per 1,000 person-years. In Asia, from 1999 to 2019, the number of NAFLDs was 50.9 per 1,000 person-years. In South Korea, it was 45.1 per 1,000 person-years. (Huh,2022). NAFLD is more common in males than in females, especially in middle-aged people. After menopause, the incidence rises and peaks at age 60. Severe liver fibrosis is more common in men and is equally prevalent in postmenopausal women. The risk of NAFLD is also raised by risk factors such as metabolic syndrome and hypertension. (Huh,2022).

Out of 589 individuals, 69.3% were male, 10.4% had steatosis exceeding 30%, and 2.2% had non-alcoholic steatohepatitis. Obesity and hypertriglyceridemia were the independent risk factors for >30% steatosis, as was age over thirty. (Lee, 2007).

Eleven percent of people had NAFLD. Male sex (OR = 1.44), obesity (OR = 7.21), diabetes mellitus (OR = 2.08), total cholesterol ≥240 mg/dL (OR = 1.50), and triglycerides ≥150 mg/dL (OR = 1.76) were the risk variables for NAFLD in the general population. (Chen,2006).

The higher prevalence of NAFLD in females and the major risk factor is obesity in Pakistan. (Waseem, 2023).

In Wuhan, central China's Shigenobu area, the prevalence of FLD has increased over the past ten years. It is directly linked to male sex, aging, obesity, and other characteristics of the metabolic syndrome. (Zhongli Wang, 2007).

The research conducted at PMAS Arid Agriculture University Rawalpindi, Pakistani population regarding the Prevalence and identification of fatty liver (FL) risk markers shows that the incidence of fatty liver is high in men over 40 years old) 78%) and in patients who are obese (55.9%).(Fatima, M, and Khan, M. J,2015). Bally, nonalcoholic fatty liver disease is the most

common cause of liver disease. Males are more likely than females to have NAFLD, with an estimated 47 instances per 1,000 people worldwide. Adults with NAFLD are predicted to have a 32% global prevalence, with males having a greater prevalence (40%) than females (26%). Due to varying rates of obesity, as well as genetic and socioeconomic variables. In Southeast Asia and the Americas, NAFLD prevalence exceeds 40%. (Teng,2023).

If non-alcoholic fatty liver disease is not prevented and treated, it will turn into cirrhosis of the liver, so the life expectancy is about 10 to 15 years, and eventually into liver cancer, causing the patient to die. Patients with fatty livers should exercise, eat more fruits and vegetables, avoid drinking alcohol, and lose weight. avoid sugary drinks like soda, sports drinks, juices, and sweet tea.

CONCLUSION
We conclude this study that women who are obese, older than 40, have high blood sugar, and have hypertension have a greater prevalence of NAFLD.

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Authors' Contributions
In the completion of this research, ultrasound examinations and data collection were conducted by Naseem Ullah Rahmat Zai and Sayed Azizullah Hashimi from the Department of Radiology, while the research was organized and analyzed by Saifullah Hadi, Naqeebullah Hadi, and Aimal Sherzai.

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