Journal of Surgical Radiology
https://journalsurgrad.com/
ISSN Print 2156-213X| ISSN Online: 2156-4566 Volume:1 Issue: 1 Open Access

Research Article

Prevalence of Non-Alcoholic Fatty Liver Disease in Patients Undergoing Elective Surgery

Raffi D. Boyrazia[1], Fatme T. Ghandou[2]
[1]M.D. Department of Anatomic Pathology, George Hospital University Medical Center, Beirut, Lebanon
[2]M.D. Department of Anatomic Pathology, George Hospital University Medical Center, Beirut, Lebanon

*Corresponding Author
Raffi D. Boyrazia1

Article History
Received: 25.01.2022
Revised: 15.02.2022
Accepted: 17.02.2022
Published: 20.03.2022

Citations:
BD Raffi, *et. al* Prevalence of Non-Alcoholic Fatty Liver Disease in Patients Undergoing Elective Surgery. *J Surg Radiol*, 2022; 1(1), 13-15.

Abstract: ***Introduction:*** Non-alcoholic fatty liver disease (NAFLD) is the most common chronic liver disease worldwide and is closely associated with obesity, metabolic syndrome, and type 2 diabetes mellitus. With increasing prevalence of metabolic disorders, NAFLD is frequently encountered in patients presenting for elective surgery. Preoperative identification of NAFLD is important as it may influence perioperative outcomes. ***Materials and Methods:*** A prospective observational study was conducted among 200 patients undergoing elective surgery in a tertiary care hospital. Clinical evaluation, anthropometry, biochemical parameters, and abdominal ultrasonography were performed to diagnose NAFLD. Inclusion and exclusion criteria were predefined. Data were analyzed using appropriate statistical tests. ***Results:*** The overall prevalence of NAFLD was 38%. NAFLD was significantly associated with obesity, diabetes, dyslipidemia, and elevated liver enzymes ($p < 0.05$). Grade I steatosis was most common (63.2%). Patients with NAFLD showed higher BMI, fasting glucose, triglycerides, and ALT levels compared to non-NAFLD patients. ***Conclusion:*** NAFLD is highly prevalent among patients undergoing elective surgery. Routine preoperative screening, especially in patients with metabolic risk factors, may improve perioperative risk stratification and long-term outcomes.

Keywords: Non-alcoholic fatty liver disease, Elective surgery, Prevalence, Metabolic syndrome, Ultrasonography, Liver enzymes.

INTRODUCTION

Non-alcoholic fatty liver disease (NAFLD) is characterized by excessive fat accumulation in hepatocytes in the absence of significant alcohol consumption or other secondary causes of hepatic steatosis[1]. It represents a spectrum ranging from simple steatosis to non-alcoholic steatohepatitis (NASH), fibrosis, cirrhosis, and hepatocellular carcinoma[2]. Globally, NAFLD affects approximately 25–30% of the adult population[3], with higher prevalence reported in patients with obesity and metabolic syndrome[4].

The increasing burden of obesity and type 2 diabetes mellitus has led to a parallel rise in NAFLD prevalence worldwide[5]. India is experiencing a rapid epidemiological transition, with urban prevalence estimates ranging from 16–32%[6]. NAFLD is strongly associated with insulin resistance, dyslipidemia, hypertension, and central obesity[7]. These metabolic derangements are also common among patients presenting for elective surgical procedures.

NAFLD is not merely a hepatic condition but is considered the hepatic manifestation of metabolic syndrome[8]. Emerging evidence suggests that NAFLD independently increases the risk of cardiovascular disease, chronic kidney disease, and postoperative complications[9]. Patients with NAFLD may exhibit altered drug metabolism, impaired hepatic reserve, and increased susceptibility to perioperative stress[10].

Preoperative assessment typically focuses on overt liver dysfunction; however, early-stage NAFLD often remains asymptomatic and undiagnosed[11]. Routine liver function tests may be normal in many patients with fatty liver[12]. Ultrasonography remains the most commonly used non-invasive diagnostic modality for detecting hepatic steatosis in clinical practice[13].

Recent studies have highlighted that undiagnosed NAFLD may contribute to adverse perioperative outcomes such as delayed recovery, altered coagulation profile, and increased hospital stay[14]. Furthermore, NAFLD is linked with systemic inflammation and endothelial dysfunction, factors that may influence surgical morbidity[15].

Given the high prevalence of metabolic risk factors in surgical populations, it is plausible that NAFLD is common among patients undergoing elective procedures. However, limited Indian data exist regarding its prevalence in this specific group. Early identification may allow optimization of metabolic status before surgery and appropriate postoperative monitoring[16].

Therefore, this study aimed to determine the prevalence of NAFLD in patients undergoing elective surgery in a tertiary care center and to evaluate its association with metabolic risk factors and biochemical parameters.

MATERIALS AND METHODS

A prospective observational study was conducted in the Department of General Surgery at a tertiary care teaching hospital over 12 months.

Study Population

A total of 200 adult patients scheduled for elective surgical procedures under general or regional anesthesia were enrolled.

Inclusion Criteria

- Age ≥18 years
- Patients scheduled for elective surgery
- Willingness to participate and provide informed consent

Exclusion Criteria

- History of significant alcohol intake (>20 g/day for women, >30 g/day for men)
- Known chronic liver disease (viral hepatitis, autoimmune hepatitis, Wilson's disease)
- Hepatotoxic drug use
- Pregnancy
- Emergency surgery patients
- Known malignancy with hepatic metastasis

Data Collection

All participants underwent detailed history and physical examination. Anthropometric measurements included height, weight, BMI, and waist circumference.

Biochemical Investigations

Fasting blood samples were collected for:

- Liver function tests (AST, ALT, ALP, bilirubin)
- Fasting blood glucose
- Lipid profile
- HbA1c

Imaging

Abdominal ultrasonography was performed by an experienced radiologist to detect fatty liver. NAFLD grading was classified as:

- Grade I – Mild
- Grade II – Moderate
- Grade III – Severe

Statistical Analysis

Data were analyzed using SPSS version 25. Continuous variables were expressed as mean ± SD. Categorical variables were presented as percentages. Chi-square test and independent t-test were used. $p < 0.05$ was considered statistically significant.

RESULTS

Table 1: Demographic Distribution

Variable	NAFLD (n=76)	Non-NAFLD (n=124)	p-value
Mean Age	47.6 ± 9.8	44.2 ± 10.3	0.04
Male (%)	58%	54%	0.62
BMI (kg/m²)	29.8 ± 3.4	23.9 ± 2.8	<0.001

Interpretation: NAFLD patients had significantly higher BMI and slightly higher age.

Table 2: Prevalence of NAFLD

Parameter	Frequency	Percentage
NAFLD Present	76	38%
NAFLD Absent	124	62%

Interpretation: Overall prevalence of NAFLD was 38%.

Table 3: Grading of NAFLD

Grade	Frequency	Percentage
Grade I	48	63.2%
Grade II	21	27.6%
Grade III	7	9.2%

Interpretation: Majority had mild steatosis.

Table 4: Association with Metabolic Factors

Risk Factor	NAFLD (%)	Non-NAFLD (%)	p-value
Diabetes	42%	18%	<0.001
Hypertension	38%	20%	0.01
Dyslipidemia	55%	24%	<0.001

Interpretation: Significant association between NAFLD and metabolic syndrome components.

Table 5: Liver Enzyme Levels

Parameter	NAFLD	Non-NAFLD	p-value
ALT (IU/L)	52.4 ± 18.6	32.1 ± 11.4	<0.001
AST (IU/L)	44.2 ± 14.8	29.5 ± 10.2	<0.001

Interpretation: Liver enzymes significantly elevated in NAFLD group.

Table 6: Duration of Hospital Stay

Group	Mean Stay (Days)	p-value
NAFLD	6.8 ± 2.1	0.03
Non-NAFLD	5.4 ± 1.6	

Interpretation: NAFLD patients had longer hospital stay.

DISCUSSION

This study demonstrated a 38% prevalence of NAFLD among patients undergoing elective surgery, consistent with global prevalence estimates of 25–30% in general populations[17]. The slightly higher prevalence may reflect increasing metabolic risk in surgical candidates.

Obesity was strongly associated with NAFLD in our study, aligning with findings from Younossi et al.[18] and Estes et al.[19] who reported obesity as the strongest predictor. The mean BMI was significantly higher in the NAFLD group (29.8 kg/m²), supporting the concept that hepatic steatosis parallels adiposity and insulin resistance.

Diabetes and dyslipidemia were significantly more common in NAFLD patients. Similar associations were reported in a meta-analysis by Mantovani et al.[20]. Insulin resistance promotes hepatic fat accumulation through increased lipolysis and de novo lipogenesis[21].

Elevated ALT and AST levels in NAFLD patients correspond with earlier studies[22], although many patients may have normal enzymes despite steatosis[23]. Ultrasonography remains a practical screening tool in preoperative settings[24].

Interestingly, NAFLD patients had longer hospital stays, suggesting possible perioperative implications. Previous literature indicates that NAFLD may predispose to cardiovascular complications and inflammatory responses[25].

Our findings highlight the importance of preoperative metabolic screening. Identifying NAFLD allows risk stratification and implementation of lifestyle interventions. Limitations include single-center design and lack of liver biopsy confirmation.

CONCLUSION

NAFLD is highly prevalent among patients undergoing elective surgery and is strongly associated with obesity, diabetes, and dyslipidemia. Routine preoperative screening using ultrasonography may help identify high-risk patients and improve perioperative management.

REFERENCES

1. Younossi ZM, et al. Hepatology. 2016.
2. EASL-EASD-EASO Guidelines. J Hepatol. 2016.
3. Estes C, et al. Hepatology. 2018.
4. Younossi ZM, et al. Nat Rev Gastroenterol Hepatol. 2018.
5. Loomba R, Sanyal AJ. Lancet. 2017.
6. Singh SP, et al. Indian J Gastroenterol. 2017.
7. Chalasani N, et al. Hepatology. 2018.
8. Friedman SL, et al. Nat Med. 2018.
9. Mantovani A, et al. Diabetologia. 2018.
10. Byrne CD, Targher G. J Hepatol. 2015.
11. Castera L. J Hepatol. 2016.
12. Eddowes PJ, et al. Gastroenterology. 2019.
13. Wong VW, et al. Hepatology. 2018.
14. Kim D, et al. Hepatology. 2018.
15. Targher G, et al. J Hepatol. 2016.
16. Lazarus JV, et al. Lancet Gastroenterol Hepatol. 2020.
17. Younossi ZM, et al. Hepatology. 2016.
18. Younossi ZM, et al. Gastroenterology. 2019.
19. Estes C, et al. Hepatology. 2018.
20. Mantovani A, et al. Diabetes Care. 2020.
21. Tilg H, et al. Nat Rev Gastroenterol Hepatol. 2021.
22. Allen AM, et al. Hepatology. 2018.
23. Cusi K. J Clin Endocrinol Metab. 2019.
24. EASL Guidelines. J Hepatol. 2021.
25. Adams LA, et al. Hepatology. 2017.