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Clinical Profile of Patients with Hepatocellular Carcinoma in the Tertiary Care Center, North Karnataka

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ABSTRACT

The incidence of hepatocellular carcinoma (HCC) has been steadily increasing, driven by rising alcohol use, sedentary lifestyles, the prevalence of metabolic syndrome, and the limited effectiveness of antiviral therapy in curbing chronic liver disease (CLD). This study provides a retrospective analysis of HCC cases over 5 years at a tertiary care hospital in India. A total of 63 patients diagnosed with HCC over a 5-year period (2019-2024) at KLE Prabhakar Kore Hospital, Belagavi, were included. Data on demographics, clinical presentation, underlying etiology, radiological features, and staging (using the Barcelona Clinic Liver Cancer system) were analysed. Among the 63 patients, 50 (79%) were male and 13 (21%) female. Cirrhosis was present in 30 (47.6%) of cases. Common symptoms included ascites in 15 (23.8%) and jaundice in 12 (19%), although 6 (9.5%) of patients were asymptomatic at diagnosis. MAFLD - Metabolic Dysfunction-Associated Fatty Liver Disease emerged as the leading cause 27 (42.85%), followed by hepatitis B 18 (28.5%), hepatitis C 5 (7.9%), and alcoholic liver disease 3 (4.76%). A significant proportion of patients were diagnosed at advanced stages BCLC stage C in 38 (60.3%) and stage D in 25 (39.7%). Elevated alpha-fetoprotein (AFP >400 ng/mL) was found in 38 (60.3%). Macrovascular invasion and/or distant metastasis were noted in 37 (58.7%), while tumor thrombus was observed in 26 (41.26)%. MAFLD - Metabolic Dysfunction-Associated Fatty Liver Disease has surpassed viral hepatitis as the most common etiology of HCC in this cohort. The high rate of late-stage diagnosis underscores the urgent need for targeted screening and early intervention, particularly in populations with metabolic risk factors

Keywords: *metabolic dysfunction-associated fatty liver disease, epidemiology, retrospective study, bclc staging hepatocellular carcinoma..*

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1. INTRODUCTION

Hepatocellular carcinoma is the dominant primary liver cancer and now ranks among the most common and deadly malignancies worldwide [1]. Although chronic hepatitis B and C infections once accounted for most cases, their relative contribution is shrinking thanks to vaccination and antiviral therapy. At the same time, Non-alcoholic fatty liver disease and its progressive form, non-alcoholic steatohepatitis, have emerged as major drivers of liver cancer, mirroring global increases in obesity, diabetes, and sedentary lifestyles [2].

HCC nearly always develops on a background of chronic liver injury, most often cirrhosis, but MAFLD - Metabolic Dysfunction-Associated Fatty Liver Disease can occasionally give rise to malignancy in non-cirrhotic livers, complicating surveillance strategies that focus only on cirrhotic [3]. In India, rapid urbanization and dietary change have accelerated MAFLD - Metabolic Dysfunction-Associated Fatty Liver Disease prevalence while viral hepatitis and harmful alcohol use remain significant regional risks, creating a mixed etiological landscape [4].

Early diagnosis is critical because curative options, such as resection, ablation, or transplantation, are primarily restricted to small, localised tumors [3,5]. Despite guideline recommendations for six-monthly ultrasound screening in high-risk groups, many patients still present with advanced disease that can only be managed palliatively [4].

This study reviews 5 years of HCC cases (2019-2024) at a tertiary center in Belagavi, Karnataka. By analyzing patient demographics, underlying liver disease, tumor stage, and initial presentation, we aim to clarify current local trends,

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particularly the rise of metabolic liver disease and identify gaps in surveillance that may inform more effective, risk-based screening programmes.

2. MATERIALS AND METHODS

This retrospective observational study was conducted in the Department of Gastroenterology at KLE Prabhakar Kore Hospital, Belagavi. A total of 63 adult patients diagnosed with hepatocellular carcinoma (HCC) between January 2019 and December 2023 were included for analysis.

The study included adult patients aged 18 years and above who were diagnosed with hepatocellular carcinoma (HCC). The diagnosis of HCC was confirmed either through characteristic radiological imaging findings-such as arterial phase enhancement with venous or delayed phase washout on contrast-enhanced CT or MRI-or by histopathological examination. Patients fulfilling these diagnostic criteria during the study period were eligible for analysis. However, individuals below 18 years of age, those with incomplete medical records, patients with secondary liver malignancies, and cases where the diagnosis of HCC could not be definitively established were excluded from the study.

Data Collection Parameters

The following clinical and investigative data were extracted from patient records:

· Demographic details: Age, sex

· Clinical presentation: Symptoms at initial diagnosis (e.g., ascites, jaundice)

· Etiological factors: Including MAFLD, hepatitis B virus (HBV), hepatitis C virus (HCV), and alcohol-related liver disease

· Radiological imaging findings: Number and size of lesions, presence of macrovascular invasion, metastases, and tumor thrombus

· Tumor characteristics: Based on imaging and/or histopathology

· Laboratory investigations: Liver function tests and serum alpha-fetoprotein (AFP) levels

Tumor Staging- All patients were staged using the Barcelona Clinic Liver Cancer (BCLC) classification system (Stages A to D), based on tumor burden, liver function, and performance status.

Statistical Analysis

Descriptive statistics were employed for data analysis. Continuous variables were expressed as means with standard deviations, while categorical variables were presented as frequencies and percentages. Data were analyzed using Microsoft Excel and IBM SPSS Statistics version 25.0.

3. RESULTS

A total of 63 patients diagnosed with hepatocellular carcinoma (HCC) over five years were included in the study.

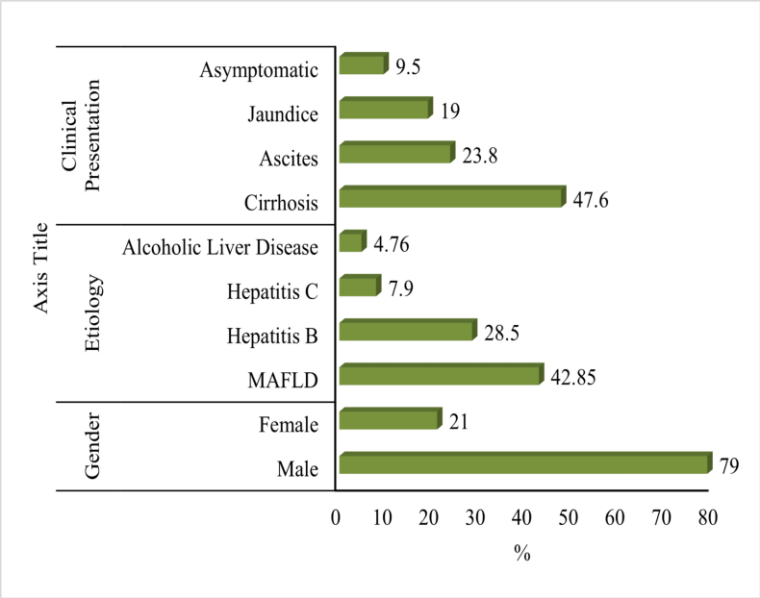
Out of 63 patients, 50 (79%) were male and 13 (21%) were female, indicating a clear male predominance. MAFLD was the most frequently observed underlying etiology, accounting for 27 (42.85%) of cases, followed by hepatitis B in 18 (28.5%), hepatitis C in 5 (7.9%), and alcoholic liver disease in 3 (4.76%) of patients. Cirrhosis was present in 30 (47.6%) of the patients, reflecting its strong association with hepatocarcinogenesis. The most common presenting symptom was ascites, seen in 15 (23.8%) of patients, followed by jaundice in 12 (19.0%). Notably, 6 (9.5%) of patients were asymptomatic at the time of diagnosis, highlighting the role of incidental or surveillance-based detection in a subset of patients [Table 1 and Figure 1].

Table 1: Demographic, Etiological, and Clinical Features of HCC Patients (n=63)

Feature	Category	n	Percentage (%)
Gender	Male	50	79
	Female	13	21
Etiology	MAFLD	27	42.85
	Hepatitis B	18	28.5
	Hepatitis C	5	7.9

	Alcoholic Liver Disease	3	4.76
Clinical Presentation	Cirrhosis	30	47.6
	Ascites	15	23.8
	Jaundice	12	19
	Asymptomatic	6	9.5

Figure 1: Distribution of Demographic, Etiological, and Clinical Features of HCC Patients



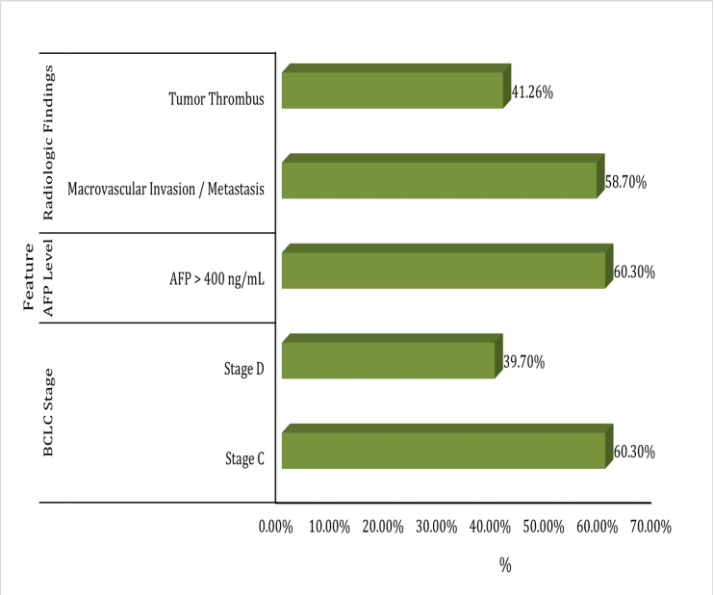
Staging based on the Barcelona Clinic Liver Cancer (BCLC) classification revealed that a significant proportion of patients presented with advanced-stage disease. Stage C was observed in 38 (60.3%) of patients, while Stage D was present in 25 (39.7%). These findings underscore the predominance of late presentation in this cohort. Serum alpha-fetoprotein (AFP) levels exceeding 400 ng/mL were noted in 38 (60.3%) of cases. While elevated AFP is a common biomarker in HCC, its limited sensitivity is reflected by the number of patients with confirmed malignancy despite lower AFP values. Radiological evaluation identified macrovascular invasion and/or distant metastasis in 37 (58.7%) of patients, while tumor thrombus was detected in 26 (41.26%) [Table 2 and Figure 2].

These aggressive tumor features were associated with poor prognosis and restricted treatment options, often necessitating palliative approaches.

Table 2: Staging and Tumor Characteristics of HCC Patients (n=63)

Feature	Category	n	Percentage (%)
BCLC Stage	Stage C	38	60.3
	Stage D	25	39.7
AFP Level	AFP > 400 ng/mL	38	60.3
Radiologic Findings	Macrovascular Invasion / Metastasis	37	58.7
	Tumor Thrombus	26	41.26

Figure 2: Distribution of Staging and Tumor Characteristics of HCC Patients



4. DISCUSSION

The study of 63 patients with hepatocellular carcinoma (HCC) provides valuable insights into the evolving clinical and etiological profile of HCC in a tertiary care setting in India. A prominent male predominance was observed, with 50 (79%) of cases being male and only 13 (21%) female. This aligns with global epidemiological trends and is likely attributable to a higher prevalence of risk factors such as alcohol use and viral hepatitis among males [1].

Cirrhosis was present in 30 (47.6%) of the cohort, reaffirming its central role in hepatocarcinogenesis. Ascites was reported in 15 (23.8%) of patients, while jaundice was seen in 12 (19.0%). Notably, 6 (9.5%) of the patients were asymptomatic at diagnosis, which suggests that a considerable subset of HCC patients may remain undetected without active surveillance. This finding underscores the importance of implementing routine screening protocols in at-risk populations.

In terms of etiology, MAFLD was the leading cause of HCC in this cohort, accounting for 27 (42.85%) of cases. Hepatitis B and C were responsible for 18 (28.5%) and 5 (7.9%) of cases, respectively, while alcoholic liver disease contributed to 3 (4.76%). This etiological shift from viral to metabolic causes of HCC mirrors global patterns, particularly in regions experiencing increased rates of obesity, insulin resistance, and metabolic syndrome. The rise of MAFLD - Metabolic Dysfunction-Associated Fatty Liver Disease as the dominant etiology raises concerns due to its often-silent clinical course, resulting in missed opportunities for early intervention [2].

Tumor staging according to the Barcelona Clinic Liver Cancer system revealed late-stage disease in most patients: 38 (60.3%) were classified as stage C and 25 (39.7%) as stage D. These advanced stages are typically associated with poor prognosis and limited eligibility for curative treatments such as surgical resection or liver transplantation [3].

Alpha-fetoprotein levels >400 ng/mL were observed in 38 (60.3%) of the patients. While elevated AFP can serve as a diagnostic and prognostic marker, its utility remains limited by suboptimal sensitivity and specificity. Hence, reliance solely on AFP levels without imaging or other biomarkers may delay diagnosis in a substantial number of cases.

Additionally, macrovascular invasion or distant metastasis was identified in 37 (58.7%) of patients, and tumor thrombus was observed in 26 (41.26%). These aggressive tumor features further limit treatment options and significantly impact survival outcomes. Their high frequency in this cohort reiterates the need for vigilant monitoring and timely diagnosis.

This retrospective single-center study has limitations, including a small sample size, reliance on hospital records with possible missing data, and lack of long-term follow-up. Some diagnoses were based solely on imaging without histopathology, which may have led to misclassification, limiting generalizability of the findings.

5. CONCLUSION

This 5-year study analysis highlights the growing impact of MAFLD - Metabolic Dysfunction-Associated Fatty Liver Disease as the leading cause of HCC. The majority of patients present at advanced stages, emphasizing the importance of early detection and routine surveillance, especially in high-risk populations. Strategic interventions are essential to curb the rising morbidity and mortality associated with late-stage HCC.

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