Diagnostic accuracy of MRCP for cholangiocarcinoma in old age People

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Abstract

Background

The most frequent primary hepatic malignancy is cholangiocarcinoma (CCA). Wide resections, the development of local treatment, and chemotherapy have all improved the prognosis in recent years.

Objective

To determine the diagnostic accuracy of MRCP for cholangiocarcinoma in old age People

Methods

A cross-sectional study was conducted at Park Hospital, New Delhi, India which was performed between February 2022 to March 2025. The total number of patients in our study were 100. The number of Male patients in our study were 57 and female were 43. For all patients, we did diagnostic tests, (CA-19-9), (MRCP, CT Scan) and lab tests. We also took the stages of cholangiocarcinoma. We took parameters of BMI (kg/m2) for all patients. We excluded pregnant women and children in our study. Data was tabulated and analyzed by SPSS version 27.

Results

In a current study total 100 patients were enrolled. The minimum age of patients were 42 years and the maximum age of the patients were 98 years. The mean age were 75.10±7.752 years. The minimum BMI of patients were 21 (kg/m2) and the maximum BMI 36 (kg/m2). The mean BMI (kg/m2) were 30.10±4.322. The minimum ALT were 72 and the maximum were 103 (u/l). The mean ALT (u/l) were 88.85±10.072. The minimum AST were 61 and the maximum were 86 (u/l). The mean AST (u/l) were 77.40±9.344. The minimum ALP were 142 and the maximum were 251 (u/l). The mean of ALP were 182.80±24.96 (u/l).

The frequency of smoking were not present in 70 patients and were present in 30 patients. The frequency of CA-19-9 were negative in 25 patients and were positive in 75 patients. P-Value were 0.04. The frequency of diagnose of cholangiocarcinoma on CT scan were 28 and diagnose on MRCP were 72 and its percentage were 70%. The frequency of fever were not present in 84 patients and were present in 16 patients and its P-value were 0.05. The frequency of loss of appetite were not present in 71 patients and were present in 29 patients. The frequency of chronic liver disease were not present in 80 patients and were present in 20 patients. The frequency of diabetes were not present in 85 patients and were present in 15 patients.

In our study P-Value were less than (< 0.05).

Conclusion

We concluded that Cholangiocarcinoma in older age people can diagnose accurately on MRCP as compared to other diagnostic modalities. Cholangiocarcinoma is common in old age people as compared to young population.

Keywords: Computed tomography (CT scan), Magnetic resonance imaging (MRI), Magnetic resonance cholangiopancreatography (MRCP), Percutaneous transhepatic cholangiography (PTC), Endoscopic retrograde cholangiography (ERC).

Introduction

Cholangiocarcinomas are categorized as either intrahepatic or extrahepatic carcinomas based on their topography. Heliar, intermediate, and distal carcinomas are other subtypes of extrahepatic cholangiocarcinomas. The bismuth classification categorizes the most prevalent kind of hilar cholangiocarcinoma into four stages [1]. According to epidemiological research, the prevalence of CCA has dramatically grown in developed countries [2]. Instead of growing radially away from the bile duct, cholangiocarcinomas frequently grow longitudinally down it. As a result, cholangiocarcinomas are difficult to detect with imaging methods such as MRI, CT, and ultrasound [3]. Furthermore, a case-control study found that risk factors such HIV infection, liver cirrhosis, diabetes mellitus, chronic inflammatory bowel diseases, and chronic hepatitis C are linked to iCCA, a disorder whose prevalence is rising quickly in industrialized countries [4]. Cross-sectional imaging should be used for staging prior to an endoscopy. With

sensitivity and specificity comparable to diagnostic endoscopic retrograde cholangiography (ERC) and percutaneous transhepatic cholangiography (PTC), magnetic resonance cholangiopancreatography (MRCP) is currently the best noninvasive technique for spatially representing the bile ducts. In addition to facilitating the evaluation of local respectability, MRI in conjunction with MRCP acts as a "route planner" for endoscopic drainage [5]. When it comes to tumor infiltration of the arteries and veins, computed tomography (CT) has a good sensitivity [6]. CCA can occasionally be diagnosed with the use of carbohydrate antigen 19-9 (CA19-9) measurements [7]. The only treatment for CCA that has the potential to be effective is complete surgical excision. No published randomized studies have examined alternative therapeutic options. Always attempt curative surgery if complete (R0) resection is believed to be possible. It is not recommended if distant metastases are present. The most crucial element for a favorable surgical outcome is R0 resection [8-9-10]. Tumor grade, vascular invasion, and lymph node involvement are additional prognostic variables. Since it is frequently impossible to rule out tumor infiltration of the perineural sheaths on intraoperative frozen sections, the safety margin should be as high as possible [11–12]. Atypical segmentectomy, segment directed resection, hemihepatectomy (left or right), expanded resections (trisectorectomy), and total lymphadenectomy are among the surgical techniques [13–14]. The majority of cholangiocarcinomas are well, moderately, and poorly differentiated adenocarcinomas; other histological subtypes are infrequently seen [15–16]. Early detection is also possible for Caroli's disease and other bile duct cystic disorders [17–18]. We will concentrate our efforts on a personalized medicine approach when it is advanced or in the adjuvant context as we continue to understand the molecular mechanisms behind the evolution of cholangiocarcinoma. For the diagnosis and staging of CCA, magnetic resonance imaging (MRI) is just as accurate as computed tomography (CT). According to recent studies looking at risk factors for the development of the disease, taking metformin is linked to a lower incidence of intrahepatic cholangiocarcinoma in patients with diabetes. Its benefits include the use of customized sequences and hepato-specific contrast material to achieve this. MR cholangiopancreatography (MRCP) and diffusion-weighted imaging (DWI) are useful tools for differentiating between iCC and HCC. The location, size, and operator competence of a liver biopsy all affect its sensitivity. For a conclusive diagnosis, core biopsies are necessary, and the needle size should be between 19 and 21 gauge, depending on the coagulation factors and the lesion's anatomical position [19-20].

MATERIALS AND METHODS

A cross-sectional study was conducted at Park Hospital, New Delhi, India which was performed between February 2022 to March 2025. The total number of patients in our study were 100. The number of Male patients in our study were 57 and female were 43. For all patients, we did diagnostic tests, (CA-19-9), (MRCP, CT Scan) and lab tests. We also took the stages of cholangiocarcinoma. We took parameters of BMI (kg/m2) for all patients. We excluded pregnant women and children in our study. Data was tabulated and analyzed by SPSS version 27.

Inclusive criteria: Included all patients who have cholangiocarcinoma and diagnosed on MRCP.

Exclusive criteria: We excluded pregnant women and children.

Results

Table 1: Mean age, BMI, ALT, AST and ALP of all the enrolled patients (*n=100*)

Variables	Minimum	Maximum	Mean±SD
Age (Years)	42	98	75.10±7.752
BMI (kg/m2)	21	36	30.10±4.322
ALT (u/l)	72	103	88.85±10.072
AST (u/l)	61	86	77.40±9.344
ALP (u/l)	142	251	182.80±24.96

In a current study total 100 patients were enrolled. The minimum age of patients were 42 years and the maximum age of the patients were 98 years. The mean age were 75.10±7.752 years. The minimum BMI of patients were 21 (kg/m2) and the maximum BMI 36 (kg/m2). The mean BMI (kg/m2) were 30.10±4.322. The minimum ALT were 72 and the maximum were 103 (u/l). The mean ALT (u/l) were 88.85±10.072. The minimum AST were 61 and the maximum were 86 (u/l). The mean AST (u/l) were 77.40±9.344. The minimum ALP were 142 and the maximum were 251 (u/l). The mean of ALP were 182.80±24.96 (u/l).

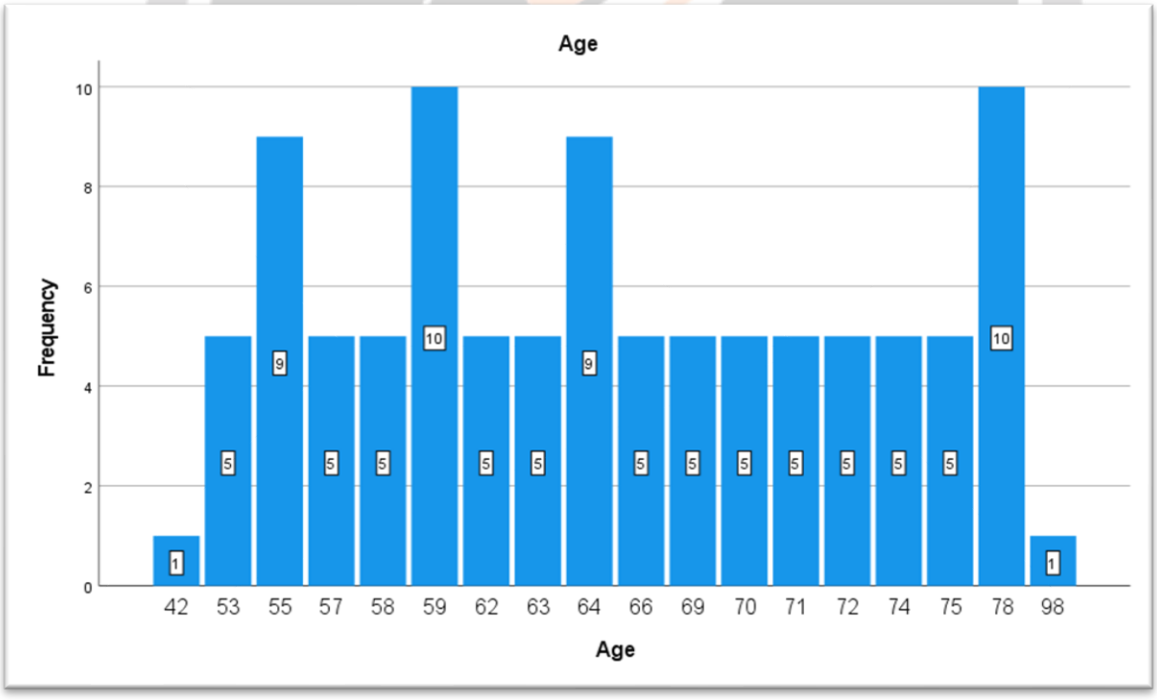

Figure 1: Bar chart of Age distribution.

Table 2: Frequency and Percentage of Gender (n=100)

Gender	Frequency	Percent	Valid Percent	Cumulative Percent
F	43	43.0	43.0	45.0
M	57	57.0	57.0	100.0
Total	100	100.0	100.0	

In the above table 2, the frequency of Female patients were 43 and the percentage were 43.0. The cumulative percent were the same 45.0. The frequency of male patients were 57 and the percentage were 57.0. Total number of patients were 100 (100 %) in our study.

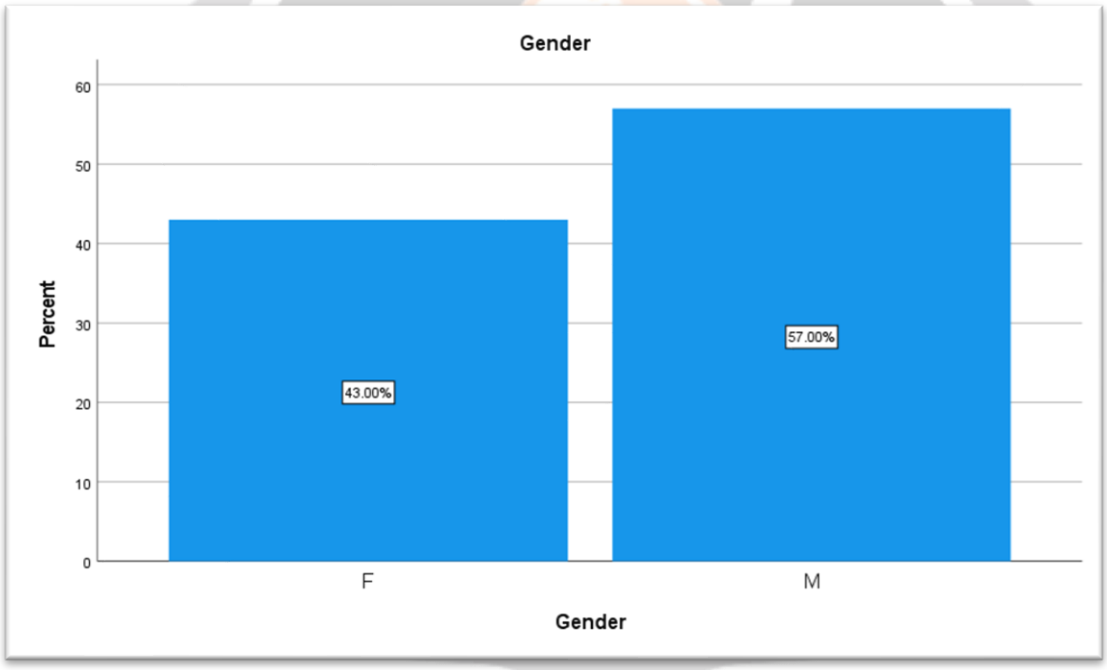

Figure 2: Bar chart of gender distribution.
In Figure 1, we did a gender distribution, we can see the male and female patient frequency in the above bar chart.

Table 3: *Patient characteristics of enrolled patients (n=100)*

Variables	Frequency	Percentage	P-Value
Jaundice			
NO	32	30.0	
YES	68	70.0	
Itchy skin			
NO	61	65.0	
YES	39	39.0	
Dark urine			
NO	71	80.0	
YES	19	20.0	
Fever			
NO	84	85.0	0.05
YES	16	15.0	
Loss of appetite			
NO	71	70.0	
YES	29	30.0	
Chronic Liver disease			
NO	80	80.0	
YES	20	20.0	
Diabetes			
NO	85	85.0	
YES	15	15.0	
Smoking			
NO	70	70.0	
YES	30	30.0	
CA-19-9			
Negative	25	25.0	0.04
Positive	75	75.0	
Diagnose on			
CT Scan	28	30.0	
MRCP	72	70.0	
Complications			
Cirrhosis	16	15.0	

Infection	20	20.0
NO	64	65.0

The current study included a total of 100 patients with cholangiocarcinoma whose characteristics are summarized in Table 3. The frequency of Jaundice were not present in 32 patients and were present in 68 patients. The frequency of Itchy skin were not present in 61 patients and were present in 39 patients. The frequency of dark urine were not present in 71 patients and were present in 19 patients.

The frequency of fever were not present in 84 patients and were present in 16 patients and its P-value were 0.05. The frequency of loss of appetite were not present in 71 patients and were present in 29 patients. The frequency of chronic liver disease were not present in 80 patients and were present in 20 patients. The frequency of diabetes were not present in 85 patients and were present in 15 patients.

The frequency of smoking were not present in 70 patients and were present in 30 patients. The frequency of CA-19-9 were negative in 25 patients and were positive in 75 patients. P-Value were 0.04. The frequency of diagnose of cholangiocarcinoma on CT scan were 28 and diagnose on MRCP were 72 and its percentage were 70%.

The frequency of complication cirrhosis were 16 , infection were 20 and were no infection 64 patients.

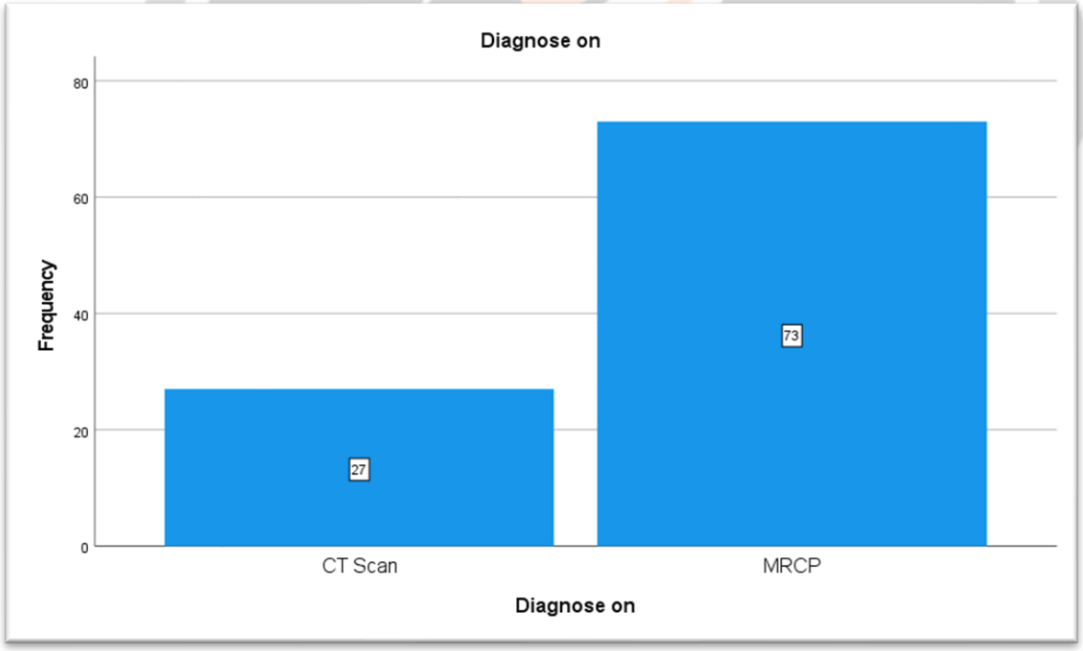

Figure 3: In Figure 3, we can see the Cholangiocarcinoma diagnosed on MRCP and CT scan comparison.

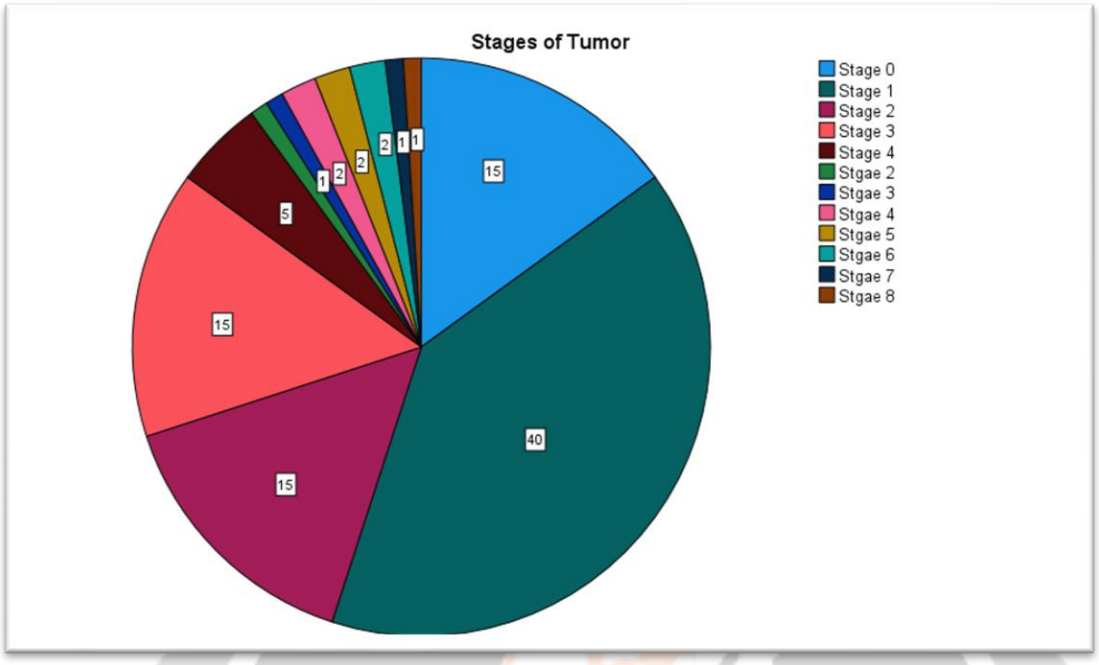

Figure 4: Pie chart shows Stages of tumor.

Discussion

There is widespread agreement that the US is the best option for diagnosing choledocholithiasis. Our findings for US diagnostic specificity, sensitivity, and accuracy are consistent with those found in previous research. A specificity of more than 90% was found by Boraschi et al. [21]. A sensitivity range of 20 to 80% is frequently reported in the literature; these significant variations in sensitivity across different case series can be partly attributed to the variability of the US technique used as well as the impossibility of approaching the distal CBD and ampullary region in obese and abdominally meteorism patients. Our study's great sensitivity is likely due to the use of dosed compression and THI, which made it possible to examine the CBD's distal tract more thoroughly. According to Ortega et al. [22], harmonic imaging highlights the distinction between the anechoicity of the duct lumen and the surrounding soft tissues by enhancing contrast resolution. According to Todua et al., CT and ultrasonography have comparable sensitivity ranges of 23% to 85% and specificity of 97% for choledocholithiasis. Similar findings were found in the current investigation. The sensitivity, specificity, and diagnostic accuracy of MRCP are similar to those found in the literature (Calvo et al., Huassein et al., Boraschi et al., Varghese et al.,), where the corresponding ranges are 81–100%, 84–100%, and 90–96% [23]. According to a study by Al-Obaidi et al. [24], MRI/MRCP had greater sensitivity (100%), specificity (98.5%), and accuracy (98.7%) for cases with benign stricture than USG (44.4%), which is in line with the current study. In their study, Andersson M et al. found that when it came to distinguishing between benign and malignant lesions in individuals with suspected periampullary tumors, MRI with MRCP was more accurate than CT. This is in line with the current study, which found that MRI/MRCP was 100% accurate in identifying periampullary cancer cases [24]. With a negative predictive value of 95.65%, the overall sensitivity, specificity, and accuracy for ultrasonography instances of cholangiocarcinoma were 66.67%, 100%, and 96%, respectively. Our study's results are in line with those of Hann et al., who found that 87% of Klatskin tumors were discovered by ultrasonography [25].

CONCLUSION:

We concluded that Cholangiocarcinoma in older age people can diagnose accurately on MRCP as compared to other diagnostic modalities. Cholangiocarcinoma is common in old age people as compared to young population.

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