Comparison of MRCP and ERCP findings: A retrospective secondary data analysis
Farman Ali, Naveed Aamir, Muhammad Kamran Hassan, Fakhar-E-Alam, Hashmat Ullah Khan, Dilaram Khan

Abstract
Objective: To compare the findings of magnetic resonance cholangiopancreatography and endoscopic retrograde cholangiopancreatography in patients presenting with bile duct disorders.
Methodology: The retrospective secondary-data study was conducted at the Gastroenterology Department of Lady Reading Hospital, Peshawar, Pakistan, and comprised data of patients who presented with bile duct disorders from June 2019 to May 2020. Data was analysed using SPSS 25.
Results: Of the 92 patients, 41(44.6%) were males and 51(55.4%) were females. The overall mean age was 50.12 ± 16.7 years (range: 13-80 years). Out of 28 bile duct calculi cases detected by endoscopic retrograde cholangiopancreatography, 25(89.3%) were detected by magnetic resonance cholangiopancreatography, and, of the 64 without calculi, it was 50(78.1%). Out of 8 bile duct strictures detected by endoscopic retrograde cholangiopancreatography, 3(37.5%) were correctly diagnosed by magnetic resonance cholangiopancreatography, and, of the 84 unaffected patients, were excluded 79(94%). Out of 64 bile duct dilatation cases, magnetic resonance cholangiopancreatography correctly diagnosed 59(92.2%), and, of the 28 unaffected patients, it excluded 27(96.4%).
Conclusion: For bile duct stone and dilation, magnetic resonance cholangiopancreatography was found to have high diagnostic accuracy.
Keywords: Choledocholithiasis, Cholangiopancreatography, MRCP, ERCP. (JPMA 72: 284; 2022)
DOI: https://doi.org/10.47391/JPMA.20-721

Introduction
Biliary tract disorders are a common cause of hospitalisation in gastroenterology units. Obstruction anywhere in the biliary tree leads to obstructive jaundice. Biliary obstruction may be caused by choledocholithiasis, cholangitis, tumours, benign and malignant strictures, trauma, pancreatic head tumours and iatrogenic causes.

Endoscopic retrograde cholangiopancreatography (ERCP) was first reported in 1968. Since then, it has been developed and accepted as a gold standard modality for the evaluation of biliary and pancreatic diseases. However, the procedure requires sedation and exposure to ionizing radiation as well as operator’s skill and experience owing to considerable risk of complications (1–7%), such as pancreatitis (3.5%), cholangitis (1%), haemorrhage (1.3%) and perforation (0.1–0.6%) as well as a recognised risk of mortality up to 1%. Due to risk of life-threatening complications, ERCP has been reserved for therapeutic purposes. Magnetic resonance cholangiopancreatography (MRCP), being a safe and non-invasive modality, has replaced diagnostic ERCP. Since its development in 1991 the technique has progressively improved. MRCP has the disadvantage that it lacks therapeutic ability whereas ERCP offers both diagnosis and treatment.

The current study was planned to compare the findings of MRCP with ERCP for diagnosing bile duct disorders.

Methods
The retrospective secondary-data study was conducted at the Gastroenterology Department of Lady Reading Hospital (LRH), Peshawar, Pakistan, and comprised data of patients who presented with bile duct disorders from June 2019 to May 2020. The data was retrieved from the institutional medical records system after approval from the institutional ethics review board. Data was retrieved for all patients who underwent ERCP and MRCP. Incomplete data was excluded. ERCP was taken as the gold standard for the diagnosis of biliary disorders, like choledocholithiasis, common bile duct (CBD) dilatation and CBD strictures. Results of MRCP were compared with those of ERCP in terms of sensitivity, specificity, positive predictive value (PPV) and negative predictive value (NPV). All procedures had been carried out by experienced endoscopists. Data was analysed using SPSS 25.

Results
Of the 92 patients, 41(44.6%) were males and 51(55.4%) were females. The overall mean age was 50.12 ±16.70
years (range:13-80 years). Of the total, 60(65.2%) patients were clinically jaundiced, while 83(90.2%) were biochemically jaundiced (Table-1).

Using MRCP, 39(42.4%) patients were found to have choledocholithiasis, 8(8.7%) had strictures and 60(65.2%) had bile duct dilation (Table-2).

Using ERCP, 28(30.4%) patients were found to have choledocholithiasis, 8(6.7%) had strictures and 64(69.6%) had bile duct dilation (Table-3).

Out of 28 ERCP-proven bile duct calculi, MRCP correctly diagnosed 25(89.3%), and, of the 64 without calculi, it detected 50(78.1%). Patients who had false-positive (FP) result for calculi on MRCP were 14(21.9%), while false-negative (FN) were 3(10.7%).

The sensitivity and specificity of MRCP for bile duct calculi were 89.3% and 78.1% respectively, while PPV was 64.1% and NPV was 94.3%.

Out of 8 ERCP-proven bile duct strictures, MRCP correctly diagnosed 3(37.5%), and, of the 84 unaffected patients, it excluded 79(94%). The sensitivity and specificity of MRCP for bile duct strictures were 37.5% and 94%, respectively, with PPV 37.5% and NPV 94%.

Out of 64 ERCP-proven bile duct dilatation cases, MRCP correctly diagnosed 59(92.2%), and, of the 28 unaffected patients, it excluded 27(96.4%). Sensitivity, specificity, PPV and NPV for dilatation were 92.2%, 96.4%, 98.3% and 84.4%, respectively.

**Discussion**

In order to evaluate disease of the bilio-pancreatic region, ERCP is the gold standard. It has accuracy of around 90-100% in detecting intra-hepatic and extra-hepatic biliary duct dilation, site, size, and numbers of bile duct strictures and stones. However, ERCP is associated with serious complications, including haemorrhage, infection, gut and duct perforation, pancreatitis and depression of the cardiopulmonary system. Complications for ERCP, such as bleeding, infection, pancreatitis and biliary leaks, have been reported to be as high as 1-7%. Possible reduction in ERCP practice has been reported by some studies after the introduction of MRCP which has several advantages. It provides information regarding gall bladder stones and cholecystitis, stone size, mass in gallbladder, thickness of gallbladder wall, common bile duct stone and its size. It can provide information regarding malignant and benign strictures. Its evolving role is to reduce or avoid the need for diagnostic ERCP because it has the ability to produce comparable highly accurate cholangiographic images like the ERCP.

Several international studies have evaluated sensitivity, specificity, PPV and NPV of MRCP as 85-97%, 75-98%, 83-89% and 82-98% respectively, for hepatobiliary system.

A literature review reported MRCP sensitivity 88.9%, specificity 100%, PPV 100% and NPV 99.2% for diagnosing biliary stone. A study reported sensitivity, specificity, PPV and NPV to be 87%, 80%, 83.3% and 84.2% respectively. Another study reported MRCP sensitivity, specificity, PPV and NPV of 85%, 93%, 87% and 96% respectively. In the current study, the sensitivity, specificity, PPV and NPV for MRCP were 89.3%, 78.1%, 64% and 94.3%, respectively, for choledocholithiasis which correlates well with earlier results.

A study reported sensitivity and specificity of MRCP for the detection of bile duct stricture as 89% and 92% respectively. In another study, sensitivity was 86% and specificity was 94% for bile duct strictures. One study reported sensitivity and specificity of 83.3% and 97.6% respectively. In the current study, sensitivity, specificity, PPV and NPV was 37.5%, 94%, 37.5% and 94%.
respectively. Compared to international data, the sensitivity was substantially low in the current study, which may be due to small number of patient (8.7%) who definitely had strictures. Another possible explanation for this may be the different MRCP protocols used for the detection of biliary disease.

The sensitivity to biliary dilatation was 87-100% and specificity 91-100% in a recent systemic review. A meta-analysis reported that MRCP had 95% sensitivity and 97% specificity for the detection of biliary dilatation. For dilation of biliary tract, the results of the current study were 92.2%, 96.4%, 98.3% and 84.4% for sensitivity, specificity, PPV and NPV, respectively. These results are similar to that of international data cited above.

Conclusion
Diagnostic accuracy of MRCP for bile duct calculi and bile duct dilation was high. The results for biliary strictures were not conclusive due to small number of patients.

Disclaimer: None.

Conflict of Interest: None.

Source of Funding: None.

References