# Original Article

## Post-ERCP pancreatitis in the Gastroenterology department of BMU

Md. Tasmir Arefin,[1] Dewan Saifuddin Ahmed,[2] Md. Masudur Rahman Khan,[3] Md. Razibul Alam,[4] Chanchal Kumar Ghosh,[5] Mohammad Shoaib Chowdhury,[6] Md. Zahidur Rahman,[7] A.B.M. Safiullah,[8] Mohammad Asadur Rahman,[9]

## Abstract

**Background:** Endoscopic retrograde cholangiopancreatography (ERCP) is an advanced endoscopic procedure used to treat pancreaticobiliary diseases. However, it poses significant risks, with post-ERCP pancreatitis (PEP) being the most common consequence, occurring in about 10.2% of cases.

**Objective:** To assess the frequency and severity of post-ERCP pancreatitis.

**Materials & Methods:** This prospective observational study was conducted among consecutive patients who underwent ERCP in the Department of Gastroenterology at Bangladesh Medical University (BMU), Dhaka, from December 2023 to February 2025.

**Results:** A total of 272 participants were evaluated. The average age was 51.2 years, with 47.1% of participants male and 52.9% female. The most common indications of ERCP were choledocholithiasis (49.6%), cholangiocarcinoma (12.1%) and papillary stenosis (10.7%). Overall, 8.8% of participants developed post-ERCP pancreatitis (PEP), 7% had mild PEP, and 1.8% had moderate PEP. No participant developed any severe PEP.

**Authors:**

**Md. Tasmir Arefin,** MBBS, MD (Gastroenterology)
Department of Gastroenterology, Bangladesh Medical University.
Email: arefintasmir@gmail.com

**Dewan Saifuddin Ahmed,** MBBS, FCPS (Medicine), MD Gastroenterology) Professor and Chairman, Department of Gastroenterology, Bangladesh Medical University.
Email: saifgastro@gmail.com

**Md. Masudur Rahman Khan,** MBBS, MD (Gastroenterology)
Professor, Department of Gastroenterology, Bangladesh Medical University.
Email: masudgastro64@gmail.com

**Md. Razibul Alam,** MBBS, MD (Gastroenterology)
Professor, Department of Gastroenterology, Bangladesh Medical University.
Email: Razibulalam73@gmail.com

**Chanchal Kumar Ghosh,** MBBS, FCPS (Medicine), MD (Gastroenterology) Professor, Department of Gastroenterology, Bangladesh Medical University, Email: dr.chanchalghosh@gmail.com

**Mohammad Shoaib Chowdhury,** MBBS, MD (Gastroenterology)
Associate Professor, Department of Gastroenterology, Bangladesh Medical University, Email: drshoaibchowdhury@gmail.com

**Md. Zahidur Rahman,** MBBS, MD (Gastroenterology)
Associate Professor, Department of Gastroenterology, Bangladesh Medical University, Email: zahidgastro@gmail.com

**A.B.M. Safiullah,** MBBS, MD (Gastroenterology)
Associate Professor, Department of Gastroenterology, Bangladesh Medical University, Email: gastrosafi67@gmail.com

**Mohammad Asadur Rahman,** MBBS, MD (Gastroenterology)
Associate Professor, Department of Gastroenterology, Bangladesh Medical University, Email: dr.asad74@gmail.com

**Affiliations:**
Department of Gastroenterology, Bangladesh Medical University, Shahbag, Dhaka, Bangladesh

**Corresponding Author:**
**Md. Tasmir Arefin,** MBBS, MD (Gastroenterology),
Department of Gastroenterology, Bangladesh Medical University, Shahbag, Dhaka, Bangladesh.
Phone: +8801683740271

## Introduction:

ERCP is an endoscopic procedure performed with a side-view scope. Since its introduction in 1968, ERCP has become an important procedure for identifying and treating numerous pancreaticobiliary diseases.

Due to advancements in alternative imaging modalities, such as magnetic resonance imaging and/or MRCP and EUS, ERCP has changed from a diagnostic procedure to a therapeutic one, mainly for stone clearance, stricture dilation, and placing stents to relieve blockage in the pancreatic and bile ducts. Common adverse events of ERCP are pancreatitis, cholangitis, cholecystitis, bleeding, and perforation. Post-ERCP pancreatitis is the most common major complication of ERCP.[1]

PEP is clinical evidence of pancreatitis following ERCP, with a three-fold increase in serum amylase after 24 hours, necessitating hospitalization or an extended hospital stay.[2] After that, Freeman added new or deteriorating abdominal pain as a new characteristic to define PEP and suggested allowing lipase as a substitute for amylase.[3] According to the European Society of Gastrointestinal Endoscopy guideline 2020, PEP is characterised by new or deteriorating abdominal pain accompanied by raised pancreatic enzymes (lipase or amylase greater than three times the normal level after 24 hours) and extending a scheduled hospital stay or necessitating hospitalization following ERCP.[4]

The pathophysiology of PEP is a complex concept that is not fully understood. This includes a variety of insults caused by papillary instrumentation, hydrostatic injury from the overfilling of the pancreatic duct with contrast material, and mechanical, chemical, thermal, enzymatic, allergic, and microbiological factors. These factors lead to a series of events that cause premature intracellular activation of pancreatic proteolytic enzymes, autodigestion, and the creation of inflammatory cytokines that have an impact on the body both locally and systemically.[5]

The severity of PEP is classified as mild, moderate, and severe. According to "cotton criteria", Mild, moderate and severe post-ERCP pancreatitis are defined as requiring hospitalization for 2-3, 4-10 and >10 days, respectively, after ERCP or the development of any complication (necrosis or pseudocyst) or requirement for any intervention (surgery or drainage).2

## Methods

This prospective observational study was conducted in the Department of Gastroenterology, Bangladesh Medical University (BMU), Dhaka, during the period from December 2023 to February 2025. Patients who met standard indications for ERCP were included in the study. Exclusion criteria were pancreatitis before ERCP.

A total of 291 patients underwent ERCP in the department of gastroenterology, during the study period. 19 patients were excluded due to pancreatitis before ERCP. 272 participants were finally enrolled in the study.

Abdominal pain 24 hours following ERCP and a three-fold or higher increase in serum amylase or lipase were considered indicators of pancreatitis. The severity of pancreatitis was defined based on the number of hospitalized days following ERCP as mild (<4 days), moderate (4 to 10 days), or severe (>10 days).[6]

Before performing ERCP, baseline serum amylase and lipase levels were measured in the patients who presented with abdominal pain clinically consistent with acute pancreatitis. All the participants obtained standard hydration and preprocedural rectal indomethacin. After ERCP, participants were assessed clinically for new or worsened abdominal pain compatible with acute pancreatitis. Serum lipase and amylase levels were measured 24 hours after ERCP. The number of days required to stay at the hospital after ERCP was also recorded.

## Results:

Most participants were between 55 and 64 years (25.37%), and females (52.9%) were predominant over males (47.1%). Table I presents the demographic distribution (by age and gender) of the participants.

**Table I:** Age and Gender distribution of the participants (n=272)

| Variables | Number of participants (n) | Percentage (%) |
|---|---|---|
| **Age (Mean±SD)** | 51.2±7.8 | |
| **Age groups(years)** | | |
| <25 | 8 | 2.94 |
| 25-34 | 26 | 9.56 |
| 35-44 | 61 | 22.42 |
| 45-54 | 57 | 20.96 |
| 55-64 | 69 | 25.37 |
| >64 | 51 | 18.75 |
| **Gender** | | |
| Male | 128 | 47.1 |
| Female | 144 | 52.9 |

**Table II:** Indications of ERCP among the participants (n=272)

| Indications | Number of participants (n) | Percentage (%) |
|---|---|---|
| Choledocholithiasis | 135 | 49.63 |
| Cholangiocarcinoma | 33 | 12.13 |
| Papillary stenosis | 29 | 10.66 |
| Benign biliary stricture | 24 | 8.82 |
| Ampullary carcinoma | 23 | 8.46 |
| Carcinoma gallbladder with biliary infiltration | 13 | 4.78 |
| Carcinoma head of the Pancreas | 10 | 3.68 |
| Biliary ascariasis | 5 | 1.83 |
| **Total** | **272** | **100** |

Table II shows, the most common indication of ERCP was choledocholithiasis (49.63%).

**Table III:** Distribution of participants based on the development of post-ERCP pancreatitis.

| Post -ERCP pancreatitis | Number of participants (n) | Percentage (%) |
|---|---|---|
| **Yes** | 24 | 8.8 |
| **No** | 248 | 91.2 |
| **Total** | **272** | **100** |

Table III shows that among all the participants, 8.8% (24 out of 272) developed post-ERCP pancreatitis

**Table IV:** Distribution of participants according to the severity of post-ERCP pancreatitis (n=272)

| Severity of post-ERCP pancreatitis | Number of participants (n) | Percentage (%) |
|---|---|---|
| Mild | 19 | 7 |
| Moderate | 5 | 1.8 |
| Severe | 0 | 0 |
| **Total** | **24** | **8.8** |

Table IV shows the severity of post-ERCP pancreatitis among all the participants. As a whole, 7% (19 out of 272) had mild and 1.8% (05 out of 272) had moderate PEP. No participant developed any severe PEP.

**Table V:** Age, Gender and indication-based distribution of participants developing post-ERCP pancreatitis (n=24)

| Age groups (years) | n (%) | Gender | n (%) | Indication | n (%) |
|---|---|---|---|---|---|
| <25 | 2 (25%) | Male | 9 (7%) | Choledocholithiasis | 9 (6.7%) |
| 25 -34 | 7 (27%) | Female | 15 (10.4%) | Cholangiocarcinoma | 6 (18.2%) |
| 35-44 | 4 (6.6%) | | | Papillary stenosis | 4 (13.8%) |
| 45-54 | 3 (5.3%) | | | Benign biliary stricture | 1 (4.2%) |
| 55-64 | 5 (7.2%) | | | Ampullary carcinoma | 2 (8.7%) |
| >64 | 3 (5.9%) | | | Carcinoma gallbladder with biliary infiltration | 2 (15.4%) |

Table V shows that the rate of developing PEP was higher in patients between 25-34 years of age, female participants, and in patients with cholangiocarcinoma.

## Discussion:

ERCP is one of the most technically demanding and high-risk procedures. The most common complication of ERCP is acute pancreatitis, which is a major cause of morbidity and mortality. A comprehensive review of one hundred eight RCTs from 1977 to 2012, including 13,296 patients, revealed that the rate of PEP was 9.7%. PEP was 5.7% for mild, 2.6% for moderate, and .5% for severe. Two thousand three hundred forty-five high-risk participants revealed PEP as 14.7%. Mild, moderate, severe PEP and PEP-related mortality were 8.6%, 3.9%, .8%, and .2%, respectively. In North American RCTs, the rate of PEP was 13%, but in European and Asian RCTs, it was 8.4% and 9.9%, respectively.[7]

In 2017, a study was performed in the BMU, including 95 participants. The mean age was 49.74 years. 58.9% patients underwent ERCP due to choledecholithiasis. Post-ERCP pancreatitis occurred in 9.4% patients.[8]

In this research, most participants (25.4%) were in the age group of 55-64 years. Gender distribution was not much different, with 47.1% males and 52.9% females. Nearly half of the participants underwent ERCP due to choledocholithiasis, 135 out of 272; 49.6%. Other indications were cholangiocarcinoma (12.13%), papillary stenosis (10.66%), benign biliary stricture (8.82%), ampullary carcinoma (8.46%), carcinoma gallbladder with biliary infiltration (4.78%), carcinoma head of the Pancreas (3.68%), biliary ascariasis (1.83%). Post-ERCP pancreatitis developed in 19 out of 24, 8.8% of participants overall. Severity analysis revealed that 19 out of 24, 7% had mild, and 05 out of 24, 1.8% had moderate PEP. No participant developed any severe PEP. The majority of people experiencing PEP were under 35 years of age, female, and cholangiocarcinoma was the primary indication.

## Conclusion:

In comparison to other endoscopic procedures, ERCP is still linked to a very high rate of complications, especially post-ERCP pancreatitis, even with advancements in technique and equipment. Most of these issues fall into the mild to moderate severity category.

## Conflict of Interest:

There is no conflict of interest of any authors in this study.

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