

## ORIGINAL ARTICLE

# FREQUENCY OF EARLY POST-ERCP ADVERSE EVENTS IN BOTH DIAGNOSTIC AND THERAPEUTIC PROCEDURES

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## ABSTRACT

**Background:** Endoscopic retrograde cholangiopancreatography (ERCP) is widely used for diagnosis and treatment of hepatobiliary disorders. However, there are many adverse events associated with this procedure. The objective of this study was to determine the frequency of early post-ERCP adverse events in both diagnostic and therapeutic procedures in our set-up.

**Material & Methods:** This cross-sectional study was conducted at Department of Gastroenterology, Hayatabad Medical Complex, Peshawar, Pakistan, from 20<sup>th</sup> December, 2016 to 20<sup>th</sup> January, 2017. Consecutive sampling technique was used. Patients undergoing ERCP whether diagnostic or therapeutic, irrespective of age and gender, were included. Those having evidence of pancreatitis, cholangitis, or previous ERCP, or abdominal surgery were excluded. The outcome was early post-ERCP complications including pancreatitis, cholangitis, bleeding and perforation. The patients were assessed for these complications immediately and 72 hours after the procedure. Demographic data like age and gender were recorded. The data regarding early post-ERCP complications were recorded and presented as frequencies.

**Results:** Total 102 patients were included in the study. Among these, 38(37.3%) were males and 64 (62.7%) females. Mean age of patients included was  $50.89 \pm 15.67$  years (range 8 to 90 years). Overall post-ERCP complications were noted in 6(5.88%) patients. The most common complication was cholangitis in 5(4.9%) patients, followed by pancreatitis in only one (0.98%). Bleeding and perforation occurred in none of our patients.

**Conclusion:** The most common Post-ERCP complication is cholangitis. Based on our findings, we suggest closer monitoring of patients undergoing ERCP for development of infection. Proper disinfection protocols should be followed to prevent infection.

**KEY WORDS:** Common bile duct; Endoscopic retrograde, Cholangiopancreatography; Cholangitis; Pancreatitis.

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## INTRODUCTION

Endoscopic retrograde cholangiopancreatography (ERCP) since its introduction in 1968 is widely used for the diagnosis and treatment of hepatobiliary disorders. However there are many adverse events (AEs) associated with ERCP.<sup>1</sup> The complications due to ERCP reported in the literature range from 5% to 10%, including both diagnostic and therapeutic procedures, and may vary from mild to severe and even life-threatening.<sup>2</sup>

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Among the AEs identified pancreatitis, bleeding, perforation, and cholangitis are the common, early and serious ones. Early recognition and appropriate management of these potential AEs is important to reduce the morbidity and mortality associated with the procedure.<sup>1</sup>

There are various risk factors proven to be associated with increased risk for these complications and these can be prevented by identifying and avoiding these risk factors. Some of the risk factors are patient-dependent, such as young age, female gender, comorbidities, sphincter of oddi dysfunction, history of previous AEs while others are procedure-dependent such as sphincterotomy, difficult cannulation and trainee involvement. Recognizing these risk factors is important to provide appropriate preventive measures.<sup>3-11</sup>

There are limited published data evaluating post-ERCP outcomes from our population. We conducted this study in a tertiary care set-up of the province

having the best possible facility and expertise. The objective of this study was to determine the frequency of post-ERCP complications in o set-up.

MATERIAL AND METHODS

This cross-sectional study was conducted at the Department of Gastroenterology, Hayatabad Medical Complex, Peshawar, Pakistan, for one month, from 20<sup>th</sup> December, 2016 to 20<sup>th</sup> January, 2017. Consecutive sampling technique was used. Patients undergoing ERCP whether diagnostic or therapeutic, irrespective of age and gender, during this period were included in the study. Those having evidence of pancreatitis, cholangitis, or previous ERCP, or abdominal surgery were excluded.

All ERCP procedures were conducted by consultant level endoscopists. Side-viewing duodenoscopy (Olympus JF-260, TJF-260V; Olympus Medical Systems, Tokyo, Japan) was performed in all cases. The outcome was early post-ERCP complications including pancreatitis, cholangitis, bleeding and perforation. The patients were assessed for these complications immediately and 72 hours after the procedure.

Pancreatitis was defined as typical epigastric pain and serum amylase at least three times above normal more than 24 hours after ERCP. Cholangitis was defined as fever of >38°C for more than 48 hours after procedure. Bleeding was defined as clinical evidence of bleeding such as haematemesis, melena or drop in haemoglobin >2g/dl. Perforation was defined as leakage of fluid or contrast, or development of signs of peritonitis after the procedure.

Demographic data like age and gender were recorded. The data regarding early post-ERCP complications like pancreatitis, cholangitis, bleeding, and perforation, were recorded and presented as frequencies.

RESULTS

A total of 102 patients were included in the study. Among these 38 (37.3%) were males and 64 (62.7%) females with a male to female ratio of 1:1.7. The mean age of patients was 50.89 ± 15.67 years and the age range was 8 to 90 years.

Table 1: The demographics of post-ERCP patients (n=102).

Characteristics			
Gender	Males	38	37.3%
	Females	64	62.7%
Age (years)	Mean	50.89 ± 15.67	
	Range	8-90	

Overall post-ERCP complications were noted in 6 (5.88%) patients. The most common complication was cholangitis in 5 (4.90%) patients, followed by pancreatitis in only one (0.98%) patient. Bleeding and perforation occurred in none of our patients.

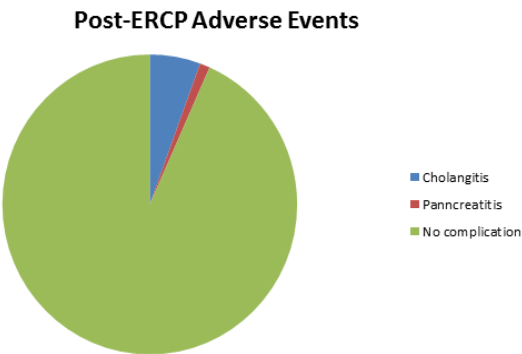


Figure 1: Frequency of early post-ERCP complications (n=102).

DISCUSSION

In this prospective study of 102 patients, we investigated the ERCP-related early AEs in a tertiary care center of the province with adequate expertise and facilities.

The complications due to ERCP as reported in the literature range from 5% to 10%.<sup>2</sup> In our study AEs developed in 5.88% of patients. The complication rates vary widely in the literature because of differences in the study designs, patient population and definition of complications. A study of 1177 patients by Christensen et al<sup>4</sup> revealed a much higher complication rate of 15.9%. Another study of 2347 patients by Freeman et al<sup>3</sup> having ERCP with sphincterotomy reported a complication rate of 9.8%. The lower complication rate in our study as compared to the two mentioned could be due to shorter i.e. 72 hours as compared to 30 days follow-up period in both the mentioned studies.

Cholangitis is a serious infective complication of ERCP and it was the most frequent complication i.e. in 4.9% of patients in our study. Outbreaks of infection after ERCP have been reported in various studies.<sup>12-14</sup> Our results are similar to those of Christensen et al<sup>4</sup> who reported cholangitis in 5% of post-ERCP patients. However, the rate of post-ERCP cholangitis was high in our study as compared to many other studies<sup>3,6,10,15</sup> which could be due to the lack of availability of pre-procedure blood cultures and thus pre-ERCP cholangitis acting as a confounding factor.

Post-ERCP pancreatitis (PEP) is a serious and the most common complication of ERCP in many studies.<sup>5,13</sup> Its frequency was lower i.e. only in 0.98% of patients in our study. Christensen et al<sup>4</sup> reported PEP in 3.8% and Freeman et al<sup>2</sup> reported PEP in 5.4% of their patients. Bleeding occurred in none of our patients. Christensen et al<sup>4</sup> reported haemorrhage in 0.88% of post-ERCP patients and Freeman et al<sup>3</sup> reported hemorrhage in 2% of their post-ERCP with sphincterotomy for all patients.

Perforation is an uncommon complication of ERCP and the management of these perforations is variable, with some patients requiring immediate surgery and others only conservative management.<sup>5</sup> The reported incidence of post-ERCP perforation is between 0.08% to 0.6%. It is usually secondary to luminal perforation

from the scope, extension of sphincterotomy cut, or bile duct perforation secondary to the guide-wire penetration outside the lumen.<sup>15,16</sup> In the current study, we found no case of perforation in our patients.

Our study has got some limitations. It does not include data about patients who developed AEs after 72 hours and readmissions were not captured; therefore, complication rates might be underestimated.

## CONCLUSION

There are fewer ERCP related complications in our set-up. The most common complication is cholangitis.

Based on our findings, we suggest closer monitoring of patients undergoing ERCP for the development of infection. Proper disinfection protocols should be followed to prevent infection and prophylactic antibiotics pre and post procedure can be considered. Additional studies are required to investigate the culture and sensitivity of organisms involved and the role of prophylactic antibiotics.

## REFERENCES

- Chandrasekhara V, Khashab MA, Muthusamy VR, Acosta RD, Agrawal D, Bruining DH, et al. Adverse events associated with ERCP. ASGE Standards of Practice Committee, Gastrointest Endosc 2017;85:32-47. <https://doi.org/10.1016/j.gie.2016.06.051>
- Freeman M. Complications of endoscopic retrograde cholangiopancreatography. Tech Gastrointest Endosc 2012;14:148-55. <https://doi.org/10.1016/j.tgie.2012.06.001>
- Freeman ML, Nelson DB, Sherman S, Haber GB, Herman ME, Dorsher PJ, et al. Complications of endoscopic biliary sphincterotomy. N Engl J Med 1996;335:909-18. <https://doi.org/10.1056/NEJM199609263351301>
- Christensen M, Matzen P, Schulze S, Rosenberg J. Complications of ERCP: a prospective study. Gastrointest Endosc 2004;60:721-31. [https://doi.org/10.1016/S0016-5107\(04\)02169-8](https://doi.org/10.1016/S0016-5107(04)02169-8)
- Enns R, Eloubeidi MA, Mergener K, Jowell PS, Branch MS, Pappas TM, et al. ERCP-related perforations: risk factors and management. Endoscopy 2002;34:293-8. <https://doi.org/10.1055/s-2002-23650>
- Cotton P, Garrow DA, Gallagher J, Romagnuolo J. Risk factors for complications after ERCP: a multivariate analysis of 11497 procedures over 12 years. Gastrointest Endosc 2009;70:80-8. <https://doi.org/10.1016/j.gie.2008.10.039>
- Khashab MA, Tariq A, Tariq U, Kim K, Ponor L, Lennon AM, et al. Delayed and unsuccessful endoscopic retrograde cholangiopancreatography are associated with worse outcomes in patients with acute cholangitis. Clin Gastroenterol Hepatol 2012;10:1157-61. <https://doi.org/10.1016/j.cgh.2012.03.029>
- Balmadrid B, Kozarek R. Prevention and management of adverse events of endoscopic retrograde cholangiopancreatography. Gastrointest Endosc Clin N Am 2013;23:385-403. <https://doi.org/10.1016/j.giec.2012.12.007>
- Young Bang J, Cote GA. Rare and underappreciated complications of endoscopic retrograde cholangiopancreatography. Tech Gastrointest Endosc 2014;16:195-201. <https://doi.org/10.1016/j.tgie.2014.07.007>
- Rustagi T, Jamidar PA. Endoscopic retrograde cholangiopancreatography related adverse events: general overview. Gastrointest Endosc Clin N Am 2015;25:97-106. <https://doi.org/10.1016/j.giec.2014.09.005>
- Vandervoort J, Soetikno RM, Tham TC, Wong RC, Ferrari AP Jr, Montes H, et al. Risk factors for complications after performance of ERCP. Gastrointest Endosc 2002;56:652-6. [https://doi.org/10.1016/S0016-5107\(02\)70112-0](https://doi.org/10.1016/S0016-5107(02)70112-0)
- Rutala WA, Weber DJ. ERCP scopes: What can we do to prevent infections? Infect Control Hosp Epidemiol 2015;36:643-8. <https://doi.org/10.1017/ice.2015.98>
- Cotton PB, Connor P, Rawls E, Romagnuolo J. Infection after ERCP and antibiotic prophylaxis: a sequential quality-improvement approach over 11 years. Gastrointest Endosc 2008;67:471-5. <https://doi.org/10.1016/j.gie.2007.06.065>
- Othman MO, Guerrero R, Elhanafi S, Davis B, Hernandez J, Houle J, et al. A prospective study of the risk of bacteremia in directed cholangioscopic examination of the common bile duct. Gastrointest Endosc 2016;83:151-7. <https://doi.org/10.1016/j.gie.2015.05.018>
- Masci E, Toti G, Mariani A, Curioni S, Lomazzi A, Dinelli M, et al. Complications of diagnostic and therapeutic ERCP: a prospective multicenter study. Am J Gastroenterol 2001;96:417-23. <https://doi.org/10.1111/j.1572-0241.2001.03594.x>
- Williams EJ, Taylor S, Fairclough P, Hamlyn A, Logan RF, Martin D, et al. Risk factors for complication following ERCP: results of a large-scale, prospective multicenter study. Endoscopy 2007; 39:793-801. <https://doi.org/10.1055/s-2007-966723>

## CONFLICT OF INTEREST

Authors declare no conflict of interest.  
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None declared.

## AUTHORS' CONTRIBUTION

The following authors have made substantial contributions to the manuscript as under:

Conception or Design:	DN, SAA, SR
Acquisition, Analysis or Interpretation of Data:	DN, SAA, SR
Manuscript Writing & Approval:	DN, SAA, SR

All the authors agree to be accountable for all aspects of the work in ensuring that questions related to the accuracy or integrity of any part of the work are appropriately investigated and resolved.



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