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Risk Factors and Incidence of Post-Endoscopic Retrograde Cholangiopancreatography (ERCP) Pancreatitis: A Cross-Sectional Study at Bangabandhu Sheikh Mujib Medical University, Bangladesh

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Abstract:
Background: *Endoscopic retrograde cholangiopancreatography (ERCP) is a crucial diagnostic and therapeutic procedure for biliopancreatic disorders. However, it carries a risk of complications, with post-ERCP pancreatitis (PEP) being the most common. This study aimed to evaluate the incidence and risk factors associated with post-ERCP complications in a tertiary care setting in Bangladesh.*
Methods: *This cross-sectional study was conducted at Bangabandhu Sheikh Mujib Medical University, Dhaka, from August 2019 to March 2021. Two hundred hospitalized patients undergoing ERCP were included. Patient demographics, clinical characteristics, and ERCP-related information were collected. Biochemical parameters were evaluated 24 hours post-procedure. Univariate and multivariate analyses were performed to identify risk factors for post-ERCP complications.*
Results: *The majority of patients (32.9%) were aged 61-70 years, with a slight female predominance (51.5%). Univariate analysis identified age ≤60 years, female sex, prior cholecystectomy, and CBD diameter ≤1 cm as significant risk factors for post-ERCP complications. Multivariate regression analysis confirmed CBD diameter ≤1 cm as an independent risk factor. Other patient-related factors such as periampullary diverticula, thrombocytopenia, and coagulopathy were not significantly associated with complications.*
Conclusion: *This study identified CBD diameter ≤1 cm as a significant independent risk factor for post-ERCP complications in our population. Understanding these risk factors can help in stratifying patients and implementing preventive measures to reduce the incidence of post-ERCP complications.*
Key words: *Post-ERCP Pancreatitis, Retrograde cholangiopancreatography, Biliopancreatic disorders*

I. Introduction

A procedure called endoscopic retrograde cholangiopancreatography (ERCP) combines endoscopic and fluoroscopic techniques. During this procedure, an upper endoscope is guided into a different part of the duodenum. This lets other drugs pass through the major duodenal papilla and into the biliary and pancreatic ducts [1,2]. Complications directly attributed to ERCP are as high as 6.8%. A quarter of these are severe and most commonly require intervention, blood transfusion of more than 4 units, or hospitalisation every 10 days. Mortality rates are about 0.3%. The incidence of post-ERCP pancreatitis (PEP) is 3.5%, making it the most frequent complication following the procedure [3].

Endoscopic retrograde cholangiopancreatography, or ERCT, is a necessary procedure used to treat problems with the biliopancreatic system, but it can have several problems. Post-ERCP pancreatitis (PEP) is the most frequent one, with an incidence ranging from 3% to 14% [4]. Several retrospective and prospective studies have evaluated risk factors for post-ERCP complications. The relative contribution of risk factors to morbidity and mortality after ERCP, however, is unknown. Finding these risk factors can help doctors figure out which

patients are most likely to have problems after an ERCP. These patients should be given extra care during and after the procedure, either through endoscopic or drug-based measures. Risk factors may also aid in distinguishing patients at the lowest risk for complications, as they are eligible to undergo ERCP as an outpatient procedure. Early discharge can lead to a decrease in the burden of ERCP for patients and an overall cost reduction [5].

II. Materials and Methods

The cross-sectional study was carried out at the Department of Gastroenterology, Bangabandhu Sheikh Mujib Medical University, Dhaka, from August 2019 to March 2021. A total of 200 hospitalised patients undergoing ERCP based on clinical indication and proper investigation were included in this study. Patients with pancreatitis and cholangitis were excluded from this study Sociodemographic data, all clinical characteristics and ERCP-related information were recorded in a data collection sheet. All the investigations were done at Bangabandhu Sheikh Mujib Medical University. This study has a minimal chance of physical risks during blood sample collection and every effort was made to minimise the risk. Approval of the Institutional Ethical Review Board was taken if there were any changes involving the rights and welfare of the subject or any changes in the methodology before making any such change. Patient demographics, biochemical parameters and patient-related risk factors (age, sex, H/O PEP). ERCP procedure risks include periampullary diverticula, a history of cholecystectomy, normal S. bilirubin, thrombocytopenia, coagulopathy, pancreatic divisum, CBD diameter, problems with cannulation, precut access, at least two pancreatic contrast injections, 21 pancreatic deep wire passes, major papilla pancreatic sphincterotomy, and CBD. Biliary stent placement, Pancreatic stent placement, failed biliary access/drainage) and follow-up data were recorded on a standardised data collection form at the time of the procedure and after the procedure. After ERCP patient was observed and followed up for post-ERCP complications. Serum amylase and lipase levels were evaluated at 24 hr, and a complete blood count, bilirubin, S.ALP, and creatinine was evaluated 24 hours after the procedure. All enrolled patients required at least 2 days of hospitalisation after ERCP, even if complications were not present. Statistical analyses were carried out by using the Statistical Package for Social Sciences version 23.0 for Windows (SPSS Inc., Chicago, Illinois, USA), Chi-Square was used to analyse the categorical variables, shown with cross-tabulation. Univariate and multivariate analyses were used for risk factors of post-ERCP. p values <0.05 were considered statistically significant.

III. Results

Table 1 show that the majority of 46 (32.9%) patients belonged to the age group 61-70 years. More than half (51.5%) of patients were female and the rest (48.5%) were males. Patient-related factors like periampullary diverticula, thrombocytopenia, and coagulopathy were not statistically linked to overall complications after ERCP, as shown in Table Il. However, age, sex, having had ERCP pancreatitis before, having a normal serum bilirubin level, having a pancreatic divisum, and a CBD diameter of less than 1 cm were all linked to overall post-ERCP complications. Table II shows that in univariate analysis age ≤ 60 years, female, prior cholecystectomy and CBD diameter (≤1 cm) were statistically significant. Table IV shows that in multivariate regression only CBD diameter (≤1 cm) was statistically significant for overall post ERCP complications.

Table I: Demographic characteristics of the study patients (n=200)

Variables	Frequency	Percentage
Age group (years)		
≤60	117	58.5
>60	83	41.5
Mean±SD	54.31±14.52	
Sex		
Male	97	48.5
Female	103	51.5

Table II: Association of patients of patients related factors with overall post ERCP complications (n=200)

Patients related factors	Post ERCP Complication (n=30) n (%)	Outcome No complication (n=170) n (%)	P value
Age group			
≤60 years	25(83.3)	92(54.1)	0.003[s]
>60 years	5(16.7)	78(45.9)	
Sex			
Male	7(23.3)	90(52.9)	0.003[s]
Female	23(76.7)	80(47.1)	
H/O post ERCP pancreatitis			
Yes	2(6.7)	0(0.0)	0.022[s]
No	28(93.3)	170(100)	
Periampullary Diverticula			
Yes	6(20.2)	10(5.9)	0.019[s]
No	24(80.0)	160(94.1)	
Prior Cholecystectomy			
Yes	10(33.3)	20(11.8)	0.002[s]
No	20(66.7)	150(88.2)	
Normal S. bilirubin			
Yes	12(40.0)	43(25.3)	0.096[ns]
No	18(60.0)	127(74.7)	
Thrombocytopenia			
Yes	2(6.7)	2(1.2)	0.108[ns]
No	28(93.3)	168(98.8)	
Coagulopathy			
Yes	6(20.0)	21(12.4)	0.196[ns]
No	24(80.0)	149(87.6)	
Pancreatic divisum			
Yes	2(6.7)	0(0.0)	0.001[s]
No	28(93.3)	170(100)	
CBD diameter			
Yes	19(63.3)	55(32.4)	0.001[s]
No	11(36.7)	115(67.6)	

S=significant; ns= not significant; p= value reached from chi square test

Table III: Univariate analysis of patients related factors with overall post ERCP complications.

Parameters	Univariate		
	OR	95% CI Lower-upper	P value
Age ≤ 60 years	4.23	1.54-11.59	0.005
Female	3.70	1.51-9.08	0.004
H/o post ERCP	1.55	0.73-13.52	0.999
Pancreatitis			
Periampullary	0.71	0.26-1.99	0.519
Diverticula			
prior	3.81	1.09-13.00	0.041
Cholecystectomy			
Normal S. bilirubin	1.61	0.856-3.01	0.140
Thrombocytopenia	2.88	0.29-28.16	0.364
Coagulopathy	1.12	0.53-2.73	0.652
Pancreatic	0.94	0.58-15.26	0.996
Divisum			
CBD diameter (≤1 cm)	2.18	1.26-4.09	0.008

Table IV: Multivariate analysis of patients related factors with overall post ERCP complications

Parameters	Multivariate		
	OR	95%CI Lower-Upper	P value
Age ≤60 years	1.08	0.23-7.41	0.398
Female	2.54	0.88-9.56	0.114
Prior	3.48	0.78-11.99	0.089
Cholecystectomy			
CBD diameter (≤ 1 cm)	3.49	1.49-10.71	0.046

IV. Discussion

This was a cross-sectional study conducted in the department of Gastroenterology, BSMMU during June 2019 to March 2021. All patients undergoing ERCP at gastroenterology department of BSMMU were screened for eligibility and offered inclusion into the study if eligible and 200 patients were eventually enrolled into the study.

In this study we observed that majority 46(32.9%) patients belonged to age group 61-70 years. More than half 51.5% patients were female and rest 48.5% was males, which are almost similar to other studies done by Kwak et al. [6] and cotton et al. [7]

In this study we found that patients related factors such as periampullary diverticula, thrombocytopenia and coagulopathy were not statistically significant with overall post ERCP complications. However, age sex, H/O post ERCP pancreatitis, prior cholecystectomy, normal serum bilirubin, pancreatic divisum and CBD diameter (≤1cm) complications [8,9]. In multivariate analysis only CBD diameter ≤1 cm was independent risk factors for CBD diameter ≤1 cm was independent risk factors for overall post-ERCP complications, which is not consistent with previous study [9]. Normal calibre CBD resulting in difficult cannulation which may cause excessive local trauma and tissue injury leading to overall complications.

In this study univariate analysis age 60 yrs, female, prior cholecystectomy and CBD diameter (≤1cm) were statistically significant, Multivariate regression only CBD diameter (≤1 cm) was statistically significant for overall post ERCP complications. However, in multivariate logistic regression only ≥1 pancreatic deep wire pan was independent risk factor for overall pond ERCP complications which are not consistent with data of previous study, probably because of high prevalence of this factors (21.4%) 30 of 140 [9,10,11]. In multivariate analysis showed only normal serum bilirubin was independent k factor for post ERCP pancreatitis similar to studies by Testoni et al. [12]

V. Conclusion

In this way, CBD diameter (≤1 cm) and pancreatic deep wire pass (≤1) were found to be the risk factors in overall post-ERCP complications. Normal serum bilirubin, pancreatic deep wire passes (≤1) and major papilla pancreatic sphincterotomy were found to be the risk factors for post-ERCP pancreatitis

Reference

[1]. Devis J, Sreevastava DK, Dwivedi D. Galgi S. Sud S, Dudeja P. A Comparison of Stress Response between Insertion of Gastro-laryngeal Tube and Endotracheal Intubation in Patients Undergoing Upper Gastrointestinal Endoscopic Procedures for Endoscopic Retrograde Cholangiopancreatography Anesth Essays Res. 2019 Jan-Mar; 13 (1) :13-18.

[2]. Halász A, Pécsi D, Farkas N, Izbéki F, Gajdán L, Fejes R, et al. Outcomes and timing of endoscopic retrograde cholangiopancreatography for acute biliary pancreatitis. Digestive and Liver Disease 2019; 51:1281–6.

[3]. Meseeha M, Attia M. Endoscopic retrograde cholangiopancreatography (ERCP). Statpearls [Internet].2020 Apr 27.

[4]. Perdigoto DN, Gomes D, Almeida N, Mendes S, Alves AR, Camacho E, Tome L, Risk Factors for Post-Endoscopic Retrograde Cholangiopancreatography Pancreatitis in the Indomethacin Era-A Prospective study. GE-Portuguese Journal of Gastroenterology.2019;26(3):176-83.

[5]. Cheng CL, Sherman S, Watkins JL, Barnett J, Freeman M, Geenen J, Ryan M, Parker H, Frakes JT, Fogel EL, Silverman WB. Risk factors for post-ERCP pancreatitis: a prospective multicentre study. Official journal of the American College of Gastroenterology ACG. 2006 Jan 1;101(1):139-47.

[6]. 6.Kwak N, Yeoun D, Arroyo-Mercado F, Mubarak G, Cheung D, Vignesh S, Outcomes and risk factors for ERCP-related complications in a predominantly black urban population. BMJ open Gastroenterology.2020 Sep 1;7(1): e000462.

[7]. Cotton PB, Garrow DA, Gallagher J, Romagnolo J. Risk factors for complications after ERCP: a multivariate analysis of 11,497 procedures over 12 years Gastrointestinal endoscopy. 2009 Jul 1;70(1):80-8.

[8]. Wang P, Li ZS, Liu F, Ren X. Lu NH, Fan ZN, Huang Q, Zhang X, He LP, Sun WS, Zhao Q, Risk factors for ERCP-related complications: a prospective multicentre study. official journal of the American college of Gastroenterology ACG. 2009 Jan 1;104(1):31-40.

[9]. Vandervoort J, Soetikno RM, Tham TC, Wong RC, Ferrari Jr AP, Montes H, Roston AD Slivka A, Lichenstein DR, Ruymann FW, Van Dam J. Risk factors for complications after performance of ERCP. Gastrointestinal endoscopy .2002 Nov 1;56(5):652-6.

[10]. Jeurnink SM. Siersema PD, Steyerberg EW, Dees J, Poley JW, Haringsma J, Kuipers EJ. Predictors of complications after endoscopic retrograde cholangiopancreatography: a prognostic model for early discharge. Surgical endoscopy. 2011 sep;25(9):2892-900.

[11]. Williams EJ, EJ Taylor S, Fairclough P, Hamlyn A, Logan RF, Martin D, Riley SA, Veitch P, Wilkinson ML, Williamson PR, Lombard M. Risk factors for complication following ERCP; results of a large-scale prospective multicentre study. Endoscopy .2007 Sep; 39(09): 793-801.

[12]. Testoni PA. Why the incidence of post-ERCP pancreatitis varies considerably? Factors affecting the diagnosis and the incidence of this complication. Jop. 2002Nov 1;3(6):195-201.