

Endoscopic Retrograde Cholangiopancreatography (ERCP)

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ERCP stands for endoscopic retrograde cholangiopancreatography (ERCP). It is one of the methods which are used to visualize the pancreas and the pancreatic ducts. The advancement in technology has allowed the physician to look at the internal ducts which were quite impossible in the past years. It is one of the most performed diagnostic tests to identify the pathologies in the pancreas. It is superior to the blood test or the ultrasound for the identification of any pathology in the pancreas. It allows the physician to visualize the internal environment of the pancreas directly. ERCP is performed for many signs and symptoms. Some of them include jaundice, abdominal pain or weight loss. The other reasons to do ERCP include an abnormal finding on the ultrasound or CT scan like mass or stones (Cotton, Garrow, Gallagher, & Romagnuolo, 2009).

In the study undertaken, the author will describe and evaluate routine clinical ERCP practices, evaluate the incidence of complications and mortality, identify possible risk factors for undesired outcomes after ERCP evaluate patient pain and satisfaction after ERCP, and investigate potential predictors of pain and dissatisfaction respectively (Glomsaker, 2013).

ERCP is one of the preferred choices of diagnostic and treatment modalities for many conditions. Although this procedure is associated with multiple side effects, some of the side effects include development of pancreatitis, infection of the gallbladder and the bile ducts, hemorrhage because of injury, altered response to sedatives which may lead to depression of the cardiac or respiratory system, perforation of the ducts, damage to the tissues because of the X-rays and even death (Wang et al., 2009).

One of the most common side effects of ERCP is the development of pancreatitis. The overall incidence of occurrence of pancreatitis is almost 2 to 10 % of the patients who undergo ERCP. The incidence of pancreatitis can increase to approximately 30% in association with certain risk factors. Pancreatitis after the ERCP is usually mild but in 10% of the cases it can be severe and can be life-threatening. The mortality associated with ERCP is almost 0.1 to 0.5%. Pancreatitis in the patients is usually identified with the aid of elevated serum amylase which is raised in 75% of the cases (Thaker, Mosko, & Berzin, 2014).

Multiple methods are under consideration for the prevention of the development of side effects of ERCP including pancreatitis. One of such method is the administration of indomethacin (Elmunzer et al., 2012).

PICO table

	<i>Example:</i>
P (patient/problem)	Patients undergoing ERCP I - Administration of Indomethacin after the ERCP prevents pancreatitis C- Administration of Indomethacin after the ERCP does not prevents pancreatitis O- Pancreatitis T- Post-procedure
I (intervention/indicator)	Administration of Indomethacin after the ERCP prevents pancreatitis
C (comparison)	No Indomethacin after the ERCP
O (outcome)	Decreased incidence of Pancreatitis by identifying the possible risk factors and investigating potential predictors of pain and dissatisfaction.

It also offers a clear framework for planning, implementing and evaluating the health care practice (Horvath, 2016). In the study undertaken, the Patients undergoing ERCP will be the population of the study (P). Administration of Indomethacin after the ERCP prevents pancreatitis (I), the rate of readmission of the said population might be compared with those who will not participate in the educational program. The assumption (C) is that the participating group will have No Indomethacin after the ERCP (O). The intervention will be a 30-day program.

C1: Search Strategy

Keywords: ERCP, acute pancreatitis, indomethacin, prevention of acute pancreatitis, acute pancreatitis and ERCP,

C2: The research articles were searched on multiple research databases notably Pub Med, CINAHL, and library one search. The research article was selected from 2010 onwards. Only peer-reviewed articles were searched. The articles included randomized control trials, systemic reviews, observational studies and case-control studies. There were almost 100+ articles in each database.

There were many research articles which came up with different results. Some of the articles were for the use of indomethacin while others came up against its use.

Research articles

The study by (Elmunzer et al., 2012) highlighted the use of indomethacin in the prevention of acute

pancreatitis after ERCP. The study has done a randomized controlled trial and highlighted that acute pancreatitis could be prevented in patients after ERCP with the administration of indomethacin.

The study by (Yaghoobi et al., 2013) highlighted the effectiveness of the introduction of indomethacin just before ERCP in the prevention of acute pancreatitis in patients.

Non-research articles

The study by ("Urgent-ERCP," n.d.) presented their research to prevent the development of acute pancreatitis after ERCP. They have focused their notion not only on the pharmacological intervention including indomethacin for the prevention of acute pancreatitis after ERCP but also on the use of interventions like pancreatic stents.

The study by ("Management of Acute Pancreatitis," n.d.) is the study which has introduced the research for the management of a patient with acute pancreatitis after multiple tests including ERCP. This study has highlighted the use of indomethacin in the management of patients who undergo ERCP.

Evidence matrix

	Article 1	Article 2	Article 3	Article 4	Article 5
Authors	Elmunzer, B. J., Scheiman, J. M., Lehman, G. A., Chak, & Waljee, A. K	Yaghoobi M Rolland S Waschke KA McNabb-Baltar J Martel M Bijarchi R Szego P Barkun AN	Jianhua Wan Yuping Ren Zhenhua Zhu Liang Xia Nonghua Lu	Tenner, S., Baillie, J., DeWitt, J., & Vege, S. S.	Levenick, J. M., Gordon, S. R., Fadden, L. L., Levy, L. C., Rocky, M. J., Hyder, S. M., ... & Gardner, T. B.
Journal name	The New England Journal of Medicine	Alimentary pharmacology and therapeutics	Biomedical Central Gastroenterology	American Journal of Gastroenterology	Gastroenterology
Year of publication	2012	2013	2017	2013	2016

Research design	randomized, placebo-controlled, double-blind clinical trial,	Meta-analysis of RCTs	Meta-analysis of RCTs	RCT	RCT
Sample size	Internal audit of high-risk ERCP decide sample size	1470	3013	300	944
Outcomes variable measured	A randomized trial of rectal indomethacin to prevent post-ERCP pancreatitis	Development of acute pancreatitis after Indomethacin in patients undergone ERCP	Development of acute pancreatitis after Indomethacin in patients undergone ERCP	American College of Gastroenterology guideline: management of acute pancreatitis	Development of acute pancreatitis after Indomethacin in patients undergone ERCP
Level (I-III)	II	I	I	II	II
Quality (A, B, C)	B	A	A	B	B
Results/Author's Suggested Conclusions	The administration of indomethacin is associated with prevention of acute pancreatitis after ERCP	This study concluded that providing indomethacin before ERCP reduces development of acute pancreatitis in patients undergoing ERCP	The administration of indomethacin may not be suitable for the prevention of acute pancreatitis in the entire patient undergoing ERCP. However, it is suitable for the patients who are at high risk	This study concluded that providing indomethacin before ERCP reduces development of acute pancreatitis in patients undergoing ERCP	Administration of indomethacin before the procedure of ERCP is not effective in reducing the risk of acute pancreatitis

Recommended practice

One of the common complications of ERCP is the development of pancreatitis. It is necessary that interventions should be done to prevent this complication. One of the approaches for the prevention of acute pancreatitis after ERCP is the use of indomethacin.

The prevention of indomethacin requires not only indomethacin but also the use of nitrates. It also requires the use of certain techniques like the placement of a stent in the pancreatic duct before the

performance of the procedure so it can be saved from damage and release of enzymes which can cause pancreatitis (Arain & Freeman, 2014).

The study of (Yaghoobi et al., 2013) administration of indomethacin just before the procedure of ERCP can reduce the risk of acute pancreatitis. It is effective in both low-risk and high-risk patients.

The administration of indomethacin may not be suitable for the prevention of acute pancreatitis in the entire patient undergoing ERCP. However, it is suitable for patients who are at high risk (Wang et al., 2009) Indomethacin, when combined with sublingual nitrates, is also effective in the prevention of acute pancreatitis after ERCP in those who have not used this combination (Wang et al., 2009).

The study by (Levenick et al., 2016) highlighted the fact that indomethacin is not effective in the prevention of acute pancreatitis after ERCP.

Implementation process

Change is never easy for any person to adopt. One of the problems which can be faced is the introduction of indomethacin to the nurses. Most of the nurse may find it difficult to perform as this process requires monitoring and great skill. Intangible understanding of the concept of the nursing process, different views of the process, lack of knowledge and awareness among nurses related to the execution of the process, support of managing systems, and problems related to recording the nursing process were the main challenges that were extracted from a review of the literature (Zamanzadeh, Valizadeh, Tabrizi, Behshid, & Lotfi, 2015). To achieve the best strategy to minimize the challenge, in addition to preparing facilitators for implementation of the nursing process, an intangible understanding of the concept of the nursing process, different views of the process, and forming teams of experts in nursing education are recommended for internalizing the nursing process among nurses. These strategies result in internalizing and understanding the concept of the nursing process. Forming a team of experts in nursing education is recommended as the best way to minimize the current challenges (Zamanzadeh et al., 2015).

To implement this strategy, it is necessary that the staff should be trained properly. This requires proper classes or seminars so that the staff can be taught. It also requires the arrangement of several workshops where the staff can learn to perform this procedure with great ease and efficacy.

The staff also need to have a clear idea about the efficacy of this process. The introduction of the method may face some opposition as it is difficult, time-consuming and requires skills. All of these issues can be treated with planning.

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post-ERCP pancreatitis. *The American Journal of Gastroenterology*, 109(6), 910.

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