

DOI: 10.5455/msm.2019.31.45-48

Received: January 09 2019; Accepted: March 06, 2019

© 2019 Emir Ahmetasevic, Zijah Rifatbegovic, Dzenita Ahmetasevic, Amir Tursunovic, Nermin Musanovic, Harun Avdagic, Maja Kovacevic

This is an Open Access article distributed under the terms of the Creative Commons Attribution Non-Commercial License (<http://creativecommons.org/licenses/by-nc/4.0/>) which permits unrestricted non-commercial use, distribution, and reproduction in any medium, provided the original work is properly cited.

ORIGINAL PAPER

Mater Sociomed. 2019 Mar; 31(1): 45-48

Influence of Preoperative Endoscopic Retrograde Cholangiopancreatography (ERCP) on Bacterial Colonization of Biliary Tract in Patients Surgically Treated for Obstructive Jaundice

Emir Ahmetasevic¹, Zijah Rifatbegovic¹, Dzenita Ahmetasevic², Amir Tursunovic¹, Nermin Musanovic¹, Harun Avdagic³, Maja Kovacevic¹

¹Surgery Clinic, University Clinical Centre Tuzla, Bosnia and Herzegovina

²Clinic for Anesthesiology and Reanimatology, University Clinical Centre Tuzla, Bosnia and Herzegovina

³Clinic for Cardiovascular Surgery, University Clinical Centre Tuzla, Bosnia and Herzegovina

Corresponding author: Dzenita Ahmetasevic, MD, Clinic for Anesthesiology and Reanimatology, University Clinical Centre Tuzla, Bosnia and Herzegovina. E-mail: dzeny_9@hotmail.com. ORCID ID: <http://www.orcid.org/0000-0002-8734-9955>.

ABSTRACT

Introduction: Cancelling elective procedures on the day of surgery presents a constant problem in all higher-level medical facilities, and the research of causes, consequences and possible solutions is the duty of every facility in order to enhance the quality of healthcare services. **Methods:** This prospective study included all patients that were scheduled for surgery from March 2016 to November 2018 in the operating rooms at our Department of Surgery, including both performed and cancelled cases. Cases by different surgical departments (general surgery, gynecology, orthopedics, urology, plastic surgery, ophthalmology and otorhinolaryngology) were all included. **Results:** Out of 8201 planned elective procedures from March 2016 to November 2018 at the General Hospital "Abdulah Nakas", 7825 cases were performed and 376 cases (4.58%) were cancelled on the day of surgery. The most common reasons for cancelling a surgical procedure on the day of surgery were: lack of time to perform surgery, (33.51%), surgery cancelled due to medical/anesthetic reasons, (31.38%), surgical procedure cancelled by the surgeon on the day of surgery, (11.97%). **Conclusion:** This study has shown that the percentage of elective cases cancelled on the day of surgery at our institution stands at an acceptable 4.58%. The most common reasons for case cancellation on the day of surgery were identified. The majority of reasons for cancellation were avoidable, which means that appropriate steps could contribute to lowering the percentage of cancelled elective cases and an improved quality of healthcare services.

Keywords: cancellation of surgical procedures, reasons for cancelling, improvement of quality, avoidable and unavoidable causes.

1. INTRODUCTION

Obstructive jaundice represents pathologic condition where normal bile flow is totally or partially obstructed in any part of biliary tract. There is variety of reasons which can cause biliary obstructions like inflammatory diseases (cholangitis) benign diseases (bile stones in biliary system), malignant diseases (Klatskin tumor) or parasitosis. Bile stone presence in biliary tract is the most often reason for obstructive jaundice (1). Pancreatic head cancer is the most often malignant reason of obstructive jaundice (2). Position of pathologic cause of biliary obstruction select them as extra luminal, intraluminal and intramural (3). Hyperbilirubinemia as consequence of biliary obstruction can be reason for severe liver dysfunction and can bring patient in the life threatening position with hypoxia and brain damaging condition. In normal condition bile, biliary tract and liver are sterile and there are some chemical, physical and immunologic defensive mechanisms inside the body which provide that. For any disease that cause biliary obstruction is sufficient to change only one of quoted mechanisms and enable bacterial colonization (4). Surgical or nonsurgical diagnostic or therapeutic manipulation in that area of biliary system create ideal conditions for bacterial flora (bactibilia) development and consequentially

appearance of cholangitis which becomes additional burden in previously ill and damaged organism (5). Bacterial presence in biliary tract (bactibilia) is more often found in operated patient older than 65 years with obstructive jaundice, cholangitis and preoperatively ERCP procedure (6). Escheria coli, Klenbsiella pneumoniae, gram positive enterococces and gram negative anaerobes bacteroides fragilis are the most often found bacteria in bile (7). Absolute bacterial concentration in bile is important and only enormously high bacterial colonization over 100 000 result with cholangitis. There is only 3% of patients with cholelithiasis, 36% with choledocholithiasis and 85% with cholangitis where enormously high bacterial bile colonization is found (8). Bacterial presence in biliary tract can be result of retrograde bacterial movement from duodenum, lymphogenic invasion, portal or hepatic artery vascular spreading or result of chronic and acute cholecystitis (9). According to fact that intestinal bacterial flora is so similar with biliar bacteria found in patients with obstructive jaundice it is obvious what is the main source of microorganisms which transit in biliary system. Bactibilia in some cases brings patients in to severe cholangitis condition with high body temperature, hyperbilirubinemia, abdominal pain and hypotension which can be fatal and finish with death. Endoscopic retrograde cholangiopancreatography (ERCP) is combined endoscopic and radiographic method which enable visualization of pancreatic ducts and biliary system with direct cannulation papilla of Vater and retrograde injection of radiocontrast with duodenoscopy observation. It was first time in history done by McCune in 1968 (10). ERCP is diagnostic and therapeutic method for all patients with biliopancreatic diseases. It should be done on every patient with biliary obstruction and is unavoidable method which can provide clear scene and staging of biliopancreatic system, enable extraction of choledochal stones, provide placing the stents in common bile and pancreatic duct and can be used for biopsy of tissues in biliopancreatic system (11). ERCP beside all it's benefits has got much bigger risk for complications than any endoscopic procedure in upper digestive tract (12). Doing ERCP is clear opening of a smooth way of bacterial movement from digestive to biliary system. Preoperative ERCP together with biliar stenting has got an 8% bigger risk of bactibilia which can be proven swabbing bile during the operation. In an study which Namias has done in 2005 only 4 % of patients with preoperatively ERCP haven't had bactibilia (13).

2. AIM

- To show incidence and prevalence rate of bactibilia in patients with obstructive jaundice.
- To prove influence of preoperative ERCP on intraoperative bactibilia finding in patients operated for obstructive jaundice.

3. METHODS

Study is retrospective-prospective analysis of 102 patients with obstructive jaundice who have been operated in Surgical clinic of University clinic centre Tuzla (UCC Tuzla) in period of 3 years (2015-2018 year). All patients have been older than 14 years and have had standard and same preoperative diagnostic procedure. Patients have been operated for obstructive jaundice of benign and malignant etiology.

Intraoperative bile shunting have been done with same standard procedure for all patients after opening common bile duct and those smears have been sent on Department of microbiology in UCC Tuzla. Anamnestic data and medical documentation have shown if patients had undergone preoperative ERCP.

4. RESULTS

There have been analyzed 102 patients. Average patients age was 62,81 years (26-88 years). Males made 51% (52 patients) and females 49% (50 patients). Analysis have proven no statically significant difference between males and females (Chart 1). Analyzing obstructive jaundice prevalence in certain age groups there have been noticed symmetric rise of incidence in both genders. Patients age over 60 years takes much bigger risk of obstructive jaundice and the biggest distinction between genders was in period between 50 and 60 years. In the Table 1. it is shown direct relationship of preoperative ERCP with bactibilia and there are given additional data about patients age, gender and origine of obstructive jaundice. Statistically significant relationship ($p=0.01$) was found only between preoperative ERCP on intraoperative bactibilia while on the other side there has been found any statistically significance in relationship of patients age, gender and origine of obstructive jaundice

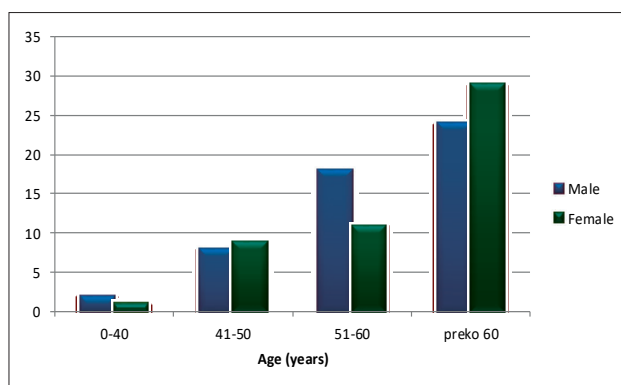


Chart 1. Patients distribution by age

Group Parameters	Patients with Bactibilia	Patients without Bactibilia	p
Age (years)	64.79 (± 13.42)	62.21(± 12.67)	0.391
Gender			
Male	13 (54.20 %)	39 (50.00 %)	0.721
Female	11 (45.80 %)	39 (50.00 %)	
ERCP			
Yes	20(83.30%)	42(53.80%)	0.010
No	4 (16.70 %)	36 (46.20 %)	
Pathology			
Benignant	10 (41.70 %)	25 (32.10 %)	0.386
Malignant	14 (58.30 %)	53 (67.90 %)	

Table 1. Impact of patient age, gender, preoperative ERCP and origine of opstructive jaundice on bacterial colonisation of biliary system

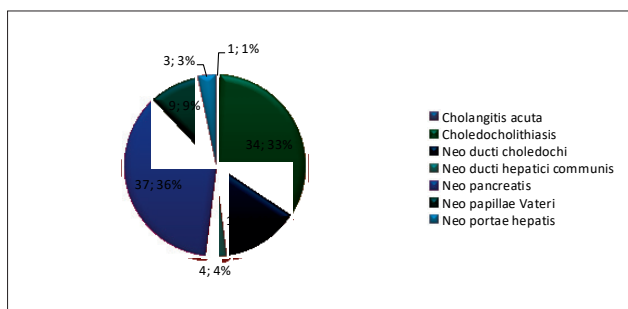


Chart 2. Distribution of benign and malignant diseases which cause opstructive jaundice

Group Opstructive jaun-dice diseases	Bactibilia YES	Bactibilia NO	Total
Cholangitis acuta	1 (1.00 %)	0 (0.00 %)	1 (1.00 %)
Choledocholithiasis	9 (8.80 %)	25 (24.50 %)	34 (33.30 %)
Neo ducti choledochi	2 (2.00 %)	12 (11.80 %)	14 (13.70 %)
Neo ducti hepatici comm	0 (0.00 %)	4 (3.90 %)	4(3.90 %)
Neo pancreatis	8 (7.80 %)	29 (28.40 %)	37 (36.30 %)
Neo papillae Vateri	4 (3.90 %)	5 (4.90 %)	9 (8.80 %)
Neo portae hepatis	0 (0.00 %)	3 (2.90 %)	3 (2.90 %)
Total	24 (23.50 %)	78 (76.50 %)	102 (100.00 %)

Table 2. Intraoperative bactibilia occurrence in different opstructive jaundice diseases. p=0.204

on intraoperative bactibilia. Distribution and percentage of diseases which cause obstructive jaundice are given in Chart 2. Leading benign disease is bile stone presence in common bile duct (choledocholithiasis) while pancreatic head cancer is most often malignant disease. Occurrence of intraoperative bactibilia for every of obstructive jaundice diseases is shown in Table 2. Comparing incidence of intraoperative bactibilia in benignant and malignant diseases there has not been found significant difference (p=0.386) as shown on Chart 3. It is definitely proven that there is significant statistical relationship (p=0,010) between preoperative ERCP and intraoperative bacterial colonization of biliary system (Chart 4).

5. DISCUSSION

Average patients age in this study was 63 years while Bjornsson (2008) found it was 71, in his two years long research in Goteborg with 241 obstructive jaundice patients.

It was confirmed in this study that both gender are almost in the same risk for obstructive jaundice (52 males and 50 females) while Chalya and all. (2011) in their study with 116 patients found females to be more often endangered with 1,3:1 ratio, but without any statistically significance. Patients age and gender together with obstructive jaundice etiology did not prove any relationship with bacterial colonization of biliary tract while preoperative ERCP has proven to have statistically significant impact on bactibilia. Namias and all (2005) in their study have shown that preoperative ERCP is connected with 8 times bigger risk for bacterial colonization of biliary system in patients with

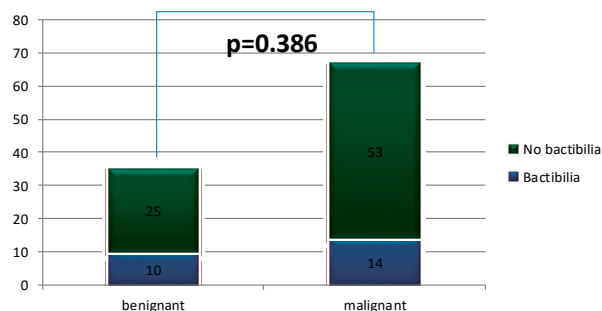


Chart 3. Etiology of opstructive jaundice and bactibilia occurrence obstructive jaundice. In the study of Sivaraj and allies (2010),

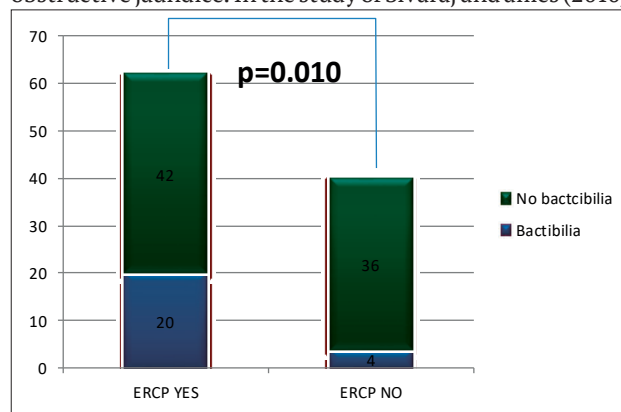


Chart 4. Relationship of preoperative ERCP and bactibilia there was 80 patient with pancreaticoduodenectomy who have undergone preoperative ERCP and intraoperative bactibilia was found in 45 patients (14). Sand and allies (1992) have shown that patients whom ERCP was done twice have bactibilia in 60% of cases, while Neve and allies (2003) prove that even 26,1 % patients with obstructive jaundice have bactibilia in the time of ERCP (15). Hui and allies (2003) have shown that cholangitis appears 26-55% more often in patients with preoperative ERCP or some of biliary drainage procedures (16).

6. CONCLUSIONS

Obstructive jaundice is very serious and risky disease which demands complex diagnostic and therapeutic approach. Most often benign reason for this pathologic condition was choledocholithiasis and among malignant, pancreatic head cancer. Patients older than 40 years are in much bigger risk for this illness and average patients age in this study was 63 years. ERCP was done in 69.8 % patients although is considered as obligatory preoperative procedure. In this study statistically significant relationship was established between preoperative ERCP and intraoperative bacterial finding in biliary tract in patients with obstructive jaundice. There has not been found relationship and influence of patients age, gender and etiology of obstructive jaundice on bacterial colonization of biliary system. Most often surgical procedures done in our study were bile stone extraction with cholecystectomy for benign etiology and some of biliodigestive anastomosis procedures for malignant etiology

- Declaration of patient consent: The authors certify that they have obtained all appropriate patient consent forms

- Author's contributions: All quoted authors gave substantial contribution in creation of this paper. Coauthors A.T, N.M, M.A collected data for three years, managed and prepared them. Coauthor Z.R was a mentor of this paper and helped with continuous revisions while coauthors D.A and H.A have done final processing and analyzing of collected information and data.
- Financial support and sponsorship: Nil.
- Conflict of interest: There are no conflicts of interest.

REFERENCES

1. Damjanovic Z, Nagorn A, Kocic G, Blagojevic Z, Mancic D, Damjanović I. Praćenje biohemijskih parametaraolestaze i intenziteta oksidativnog stresa kod bolesnika sa holedoholitijazom. *Acta Medica Medianae*. 2008; 47(3): 21-27.
2. Chalya P, Kanumba ES, Mchembe M. Etiological spectrum and treatment outcome of Obstructive jaundice at a University teaching Hospital in northwestern Tanzania: A diagnostic and therapeutic challenges. *BMC Res Notes*. 2011; 4: 147-150.
3. Blumgart LH. Surgery of the liver, biliary tract and pancreas. *Patophysiology of biliary tract obstruction*. 2007; 7: 79-81.
4. Schmidt MC, Lillemoe KD. Infections in hepatic, biliary, and pancreatic surgery. *Greenfields surgery*. 2006; 10: 125-133.
5. Wang MC, et al. The role of bacterial virulence and host factors in patients with Escherichia coli bacteremia who have acute cholangitis or upper urinary tract infection. *Clin Infect Dis*. 2002; 35: 1161-1166.
6. Neve R, Biswas S, Dhir V, Mohandas K, Kelkar R, Shukla P, Jagannath P. Bile culture and sensitivity patterns in malignant obstructive jaundice. *Indian J Gastroenterol*. 2003; 22: 16-18.
7. Dellinger EP. Approach to the patient with postoperative fever. In: Gorbach S, Bartlett J, Blacklow N. *Infectious diseases*. Philadelphia: Lippincott Williams & Wilkins. 2004; 817-823.
8. Csendes A, et al. Bacteriology of the gallbladder bile in normal subjects. *Am J Surg*. 1975; 129: 629.
9. Qiu YD, Bai JL, Xu FG, and Ding YT. Effect of preoperative biliary drainage on malignant obstructive jaundice: A meta-analysis. *World J Gastroenterol*. 2011; 17(3): 391-396.
10. McCune WS, Shorb PE, Moscowitz H. Endoscopic cannulation of the ampulla of Vater: a preliminary report. *Ann Surg*. 1968; 167: 752-756.
11. Gregory B, Gurpal S. Endoscopic retrograde cholangiopancreatography. *Diagnostic procedures et techniques*. 2000; 13: 152-153.
12. Alempijevic T, Kovacevic N, Djuranovic S, Krstic M, Ugljesic M. Correlation of abdominal ultrasonography and ERCP in patients with chronic pancreatitis. *Military medical survey*. 2005; 11: 821-824.
13. Namias N, Demoya M, Sleeman D, Reeve CM, Raskin JB, Ginzburg E, Minhaj M, Pappas PA, Padron I, Levi JU. Risk of postoperative infection in patients with bacteremia undergoing surgery for obstructive jaundice. *Surgical Infection*. 2005; 6: 323-327.
14. Sivaraj SM, Vimalraj V, Saravanabopathy P, Rajendran S, Jeswanth S, Ravichandran P, Vennilla R, Surendran R. Is bacteremia a predictor of poor outcome of pancreaticoduodenectomy? *Pancreas*. 2010; 9: 65-68.
15. Sand J, Airo I, Hiltunen KM. Changes in biliary bacteria after endoscopic cholangiography and sphincterotomy. *Am Surg*. 1992; 58: 324-328.
16. Hui CK, et al. Does the addition of endoscopic sphincterotomy stent insertion improve drainage of the bile duct in acute suppurative cholangitis? *Gastrointest Endosc*. 2003; 58: 500-504.