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EC GASTROENTEROLOGY AND DIGESTIVE SYSTEM

Research Article

Bacteriological Study of Bile Obtained by the Endoscopic Method in Patients with Removed Gallbladder

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Received: June 01, 2022; **Published:** June 27, 2022s

Abstract

The article presents the results of a bacteriological study of bile in 40 patients taken by the endoscopic method. Bacteria in duodenal bile were found in all patients (100%). Bacteria in choledocheal bile were detected in 32.5% of patients, mainly in patients with cholestasis. The bacteria of the Enterobacteraiacae family were most frequently detected. In the case of detecting bacterial contamination of duodenal bile above 10^5 CFU/g, in 92.3% of cases, bacteria were detected in the choledocheal bile. With 95% certainty, it can be argued that the risk of detecting bacteria in choledocheal bile is higher with duodenal bacteriocholia of more than 10^5 CFU/g.

Keywords: *Bacteriological Examination; Bile; Endoscopic Method; Duodenoscopy; Cholestasis*

Abbreviations

MDP: Major Duodenal Papilla; CFU/G: Colony Forming Unit/Gramm

Introduction

Purpose

To study the bacteriological composition of bile obtained by cannulation of the MDP, as well as taken from the lumen of the duodenum by the endoscopic method, in patients with a removed gallbladder.

Materials and Methods

40 patients were examined. Women - 35 people. (87.5%), men - 5 people. (12.5%). The mean age of the patients was 55.6 ± 4.8 years. The duration of cholecystectomy is 5 years. During duodenoscopy with an Olimpus TJF 30 fibrogastroduodenoscope (Japan) with a targeted examination of the MDP with lateral optics, bile was obtained for all of them: 1) by cannulating the MDP (choledochal bile), 2) from the lumen of the duodenum (duodenal bile).

Bile sampling was carried out on the basis of the endoscopic department of the City Clinical Hospital No. 7 in Kazan. Bile was delivered within 30 minutes in sterile containers to the bacteriological laboratory of the Research Institute of Epidemiology and Microbiology in Kazan.

Inoculation of material for aerobic bacteriological examination was carried out by rubbing on Petri dishes with 5% blood agar and Endo agar. The cultivation of the material for the detection of obligate anaerobes was carried out by placing it in Kita-Tarozzi medium. Incubation of ductal bile was carried out at dilutions of 1:10, 1:100 and 1:1000 at a seed dose of 0.1 ml on similar media at 35°C for 24 hours, then the number of colonies per 1 g of biopsy was counted and the titer (CFU/ G). Preliminary identification of microorganisms was carried out:

1. with microscopy of Gram-stained smears;
2. according to the results of oxidase (for gram-negative rods) and catalase (for gram-positive cocci) tests;
3. by the nature of growth and morphology of colonies on standard media [1].

Results

Bacteria in duodenal bile were found in all patients (100%). Bacteria were found in choledochal bile in 13 people. (32.5%) patients. 11 of them (27.5%) had signs of cholestasis (ALT increase to 48.2 ± 12.1 U/l, total bilirubin increase to 38.3 ± 9.5 μmol/l).

The degree of bacterial contamination of both duodenal and choledocheal bile varied from 10^2-10^9 CFU/g.

The most frequently detected bacteria of the Enterobacteraiacae family: Escherichia coli, Pseudomonas aeruginosa, Klebsiella pneumoniae as a monoculture (53.9%%) or as microbial associations (46.1%). The bacteriological composition of choledocheal bile (%) is shown in figure 1.

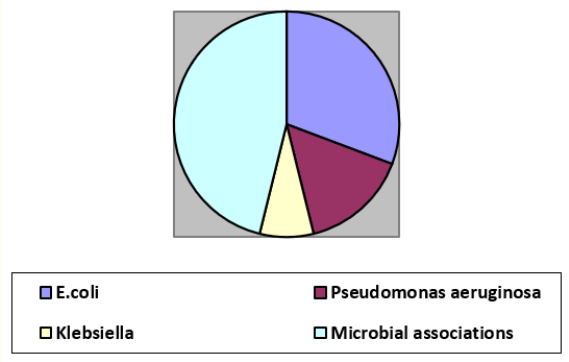

Figure 1: *Bacteriological composition of choledocheal bile (%).*

Microbial associations are represented by the following bacteria: *E. coli* (77.5%), Pseudomonas aeruginosa (52.5%), Klebsiella pneumonia (40%), Proteus vulgaris (12.5%), Staphylococcus aureus (5%), Staphylococcus epidermidis (2.5%), Streptococcus viridians (2.5%).In the case of detection of bacterial contamination of duodenal bile above 10^5 CFU/g, bacteria in 92.3% of cases were detected in the

choledocheal bile.With 95% certainty, it can be argued that the risk of detecting bacteria in the choledocheal bile is higher with duodenal bacteriocholia of more than 10^5 CFU/g (OR 22.7; 95% CI 7.0-59.3; $p < 0.05$).Choledocheal bacteriocholia correlates with indicators of cholestasis: increased aspartic transferase (OR = 22.4; 95% CI 8.1 - 68.3; $p < 0.05$), increased bilirubin (OR = 17.7; 95% CI 5.0 - 28.7; $p < 0.05$), an increase in alkaline phosphatase (OR = 21.3; 95% CI 7.9 - 62.5; $p < 0.05$). The relationship between indicators of cholestasis and choledocheal bacteriocholia is shown in figure 2.

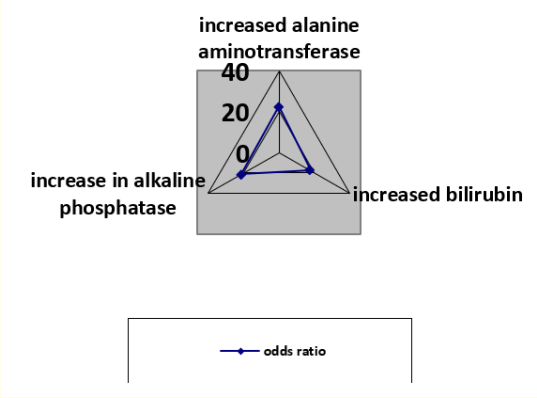

Figure 2: *The relationship between indicators of cholestasis and choledocheal bacteriocholia.*

After catheterization of the choledochus, the patients had an increase in α-amylase in the blood (before the study - 46 ± 12 U/l, after - 134 ± 15.5 U/l, $p < 0.01$). Thus, the endoscopic method of collecting bile from the duodenum during duodenoscopy is considered safe, in contrast to cannulation of the MDP, leading to reactive pancreatitis. Knowing the level of bacterial contamination of duodenal bile, we can assume the presence of bacteria in the choledocheal bile. So, if the number of bacteria in duodenal bile is more than 10^5 CFU/g, then the chance of detecting bacteria in choledocheal bile will be high.

Discussion

According to most authors, in patients with gallbladder removal, cholangitis is recorded in 12.6 - 22.6% of cases [1-4,10], the most common pathogens of which are bacteria of the Enterobacteriacae family. According to Tupitsyn M.V. [7,8], chronic cholangitis after cholecystectomy occurs in 74.5% of cases and is persistent, refractory to anti-inflammatory therapy, continuously relapsing course, reducing the ability to work and the quality of life of patients. In our study, the frequency of detected cholangitis is comparable to the data of most authors (32.5%).The ascending spread of bacterial infection is facilitated by a decrease in the areflux properties of the MDP, which in patients after cholecystectomy is caused by sphincter of Oddi dyskinesia with a predominance of its insufficiency, concomitant duodenal dyskinesia, bacterial overgrowth syndrome, and a decrease in the bactericidal properties of bile due to biliary insufficiency.To date, there are problems in diagnosing bacterial contamination of ductal bile in patients. In our opinion, the method of endoscopic bile sampling from the MDPis carried out under more aseptic conditions than duodenal sounding, but is fraught with the development of reactive pancreatitis [5,6]. In our study, an endoscopic method of bile sampling from the duodenum was used and it was shown that ductal cholangitis can be assumed on the basis of a bacteriological study of bile taken from the lumen of the duodenum during duodenoscopy. In case of detection of bacterial contamination of duodenal bile above 10^5 CFU/g, cholangitis was detected.In a study conducted by British scientists in 1978, similar results were obtained. They examined 47 patients with preserved gallbladder. During endoscopic retrograde pancreatocholangography, they took duodenal contents, as well as bile from the choledochus. It turned out that when bacteria were

detected in the duodenal contents in an amount of more than 10^5, cholangitis was diagnosed in 85% of patients [9]. In our study, 92.3% of patients were diagnosed with cholangitis. Thus, in the case of duodenal bacteriocholia more than 10^5 CFU/g, antibiotic therapy and resolution of cholestasis are recommended.

Conclusions

1. In patients with a removed gallbladder, bacteria in the choledocheal bile were detected in 32.5% of cases.
2. The microbial landscape of both choledochal and duodenal bile is mainly represented by bacteria of the Enterobacteraiacae family.
3. Bacteria in choledocheal bile were found mainly in patients with cholestasis.
4. The endoscopic method of collecting bile from the duodenum during duodenoscopy is considered safe, in contrast to the cannulation of the OBD. Knowing the bacterial contamination of duodenal bile, we can assume the presence of bacteria in the choledocheal bile. So, if the number of bacteria in duodenal bile is more than 10^5 CFU/g, then the chance of detecting bacteria in choledocheal bile will be high.
5. If a patient with a removed gallbladder has symptoms of cholestasis, duodenoscopy is recommended, followed by bile sampling from the lumen of the duodenum and its further bacteriological examination in order to timely diagnose and prevent the development of acute cholangitis. In the case of duodenal bacteriocholia more than 10^5 CFU/g, antibiotic therapy and resolution of cholestasis are recommended.

Bibliography

1. Borodach AV., *et al*. "Bacteriology and Histology of the Common Bile Duct Bacteriology and Histology of the Common Bile Duct in Choledocholythiasis and Choangitis Patients". *Annals of Surgical Hepatology* 11.31 (2006): 54-59.
2. Briskin BS and Demidov DA. "Endoscopic sanitation of the common bile duct and cholangioenterosorption in the treatment of cholangitis and obstructive jaundice". *Endoscopic Surgery* 4 (2005): 3-8.
3. Kravchuk NA. "The role of the duodenum in the pathogenesis of postcholecystectomy syndrome". *Medical Business* 2 (1985): 9-12.
4. Kravchuk NA and Pakno MM. "The effect of duodenobiliary reflux in the late stages of choledochoduodenostomy". *Clinical Surgery* 9 (1982): 52.
5. Mitusheva EI., *et al*. "Microbial composition of bile in patients after cholecystectomy". *Experimental and Clinical Gastroenterology* 2.102 (2014): 62.
6. Mitusheva EI., *et al*. "Bacteriological study of bile in patients after cholecystectomy. Materials of the XIX Annual Russian Congress "Hepatology Today". *Russian Journal of Gastroenterology, Hepatology, Coloproctology* (2014): 43-84.
7. Tupitsyn MV. "Clinical and epidemiological aspects of chronic cholangitis in patients after cholecystectomy". *Vyatka Medical Bulletin* 2 (2006): 60-61.
8. Tupitsyn MV. "Features of the course of chronic cholangitis in patients with postcholecystectomy syndrome: author. dis. ... cand. honey. Sciences". Mikhail Valentinovich Tupitsyn: 14.00.05, 14.00.19. – Tomsk (2006): 26.

9. Keighley MR and Burdon DW. "Identification of bacteria in the bile by duodenal aspiration". *World Journal of Surgery* 2 (1978): 255-259.

10. Poon RT., *et al*. "Management of gallstone cholangitis in the era of laparoscopic cholecystectomy". *The Archives of Surgery* 136.1 (2001): 11-16.

Volume 9 Issue 7 July 2022