

# Assessment of frequency and safety of endoscopic retrograde cholangiopancreatography in patients over 80 years of age

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## KEY WORDS

endoscopic retrograde cholangiopancreatography (ERCP), patients >80 years of age

## ABSTRACT

**INTRODUCTION** Biliary and pancreatic diseases, especially choledocholithiasis and neoplastic diseases, are commonly seen in elderly patients. Endoscopic retrograde cholangiopancreatography (ERCP) is a diagnostic and therapeutic procedure performed more and more frequently also in elderly patients.

**OBJECTIVES** The aim of this study was to evaluate the utility and safety of ERCP in patients >80 years of age.

**PATIENTS AND METHODS** We retrospectively analyzed 821 ERCP performed in the Department of Gastrointestinal Diseases, Medical University of Łódź in the years 2005–2007. We compared age, sex, clinical symptoms, laboratory findings, ERCP efficacy and safety in patients >80 years of age versus younger subjects.

**RESULTS** ERCP was performed in 96 patients >80 years of age (11.7%). ERCP-related complications occurred in 48 (5.8%) patients, including 44 (6.1%) younger and 4 (4.2%) older subjects ( $p > 0.05$ ). Acute pancreatitis was observed in 34 patients (32 [4.4%] younger and 2 [2.1%] older patients;  $p > 0.05$ ). In 12 patients gastrointestinal hemorrhage and in 2 patients perforation were diagnosed. There was no statistical difference between the number of complications in the 2 compared patient groups. A mean length of hospital stay was similar in both groups, 4.8 days in the younger, and 5.7 days in older patients ( $p > 0.05$ ).

**CONCLUSIONS** ERCP is a safe and effective method for diagnosis and treatment of both elderly and younger patients.

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**INTRODUCTION** Recently there has been a continuous increase observed in the number of admissions to hospital of patients advanced in age, especially >80 years of age.<sup>1,2</sup> A risk of bile duct diseases, including complicated cholelithiasis and malignant diseases, increases in the ageing population.<sup>3,4</sup> One of the procedures used in diagnostic evaluation and particularly therapy of biliary tract diseases is endoscopic retrograde cholangiopancreatography (ERCP). Currently, ERCP is mainly used to remove stones from bile ducts or to implant stents into the common bile duct and/or the main pancreatic duct.<sup>5</sup>

This procedure carries the risk of fatal complications such as acute pancreatitis, gastrointestinal hemorrhage, perforation and allergy to contrast media or drugs administered during anesthesia. These complications may be particularly harmful in elderly patients, who more often have concomitant diseases. Only a few studies assessing indications for and safety of ERCP in patients aged >80 years are available.

The aim of this study was to assess the frequency and safety of ERCP in elderly patients >80 years of age.

**TABLE 1** The comparison of numbers of women and men in relation to age in the analyzed patient groups

|            | Women       |            | Men         |            |
|------------|-------------|------------|-------------|------------|
|            | ≤80 years   | >80 years  | ≤80 years   | >80 years  |
| Number (%) | Number (%)  | Number (%) | Number (%)  | Number (%) |
| 821 (100%) | 490 (67.6%) | 78 (81.2%) | 235 (32.4%) | 18 (18.2%) |
| Total      | 568 (69.2%) |            | 253 (30.8%) |            |

**TABLE 2** The results of endoscopic retrograde cholangiopancreatography in the study groups

| Indication                    | Patients ≤80 years (n = 725) | Patients >80 years (n = 96) | p     |
|-------------------------------|------------------------------|-----------------------------|-------|
| choledocholithiasis           | 405 (55.8%)                  | 51 (53.2%)                  | NS    |
| common bile duct stricture    | 126 (17.4%)                  | 17 (17.7%)                  | NS    |
| chronic pancreatitis          | 50 (6.8%)                    | 0                           | <0.05 |
| tumor of hepatic hilus        | 47 (6.5%)                    | 11 (11.5%)                  | NS    |
| pancreatic tumor              | 42 (5.8%)                    | 8 (8.3%)                    | NS    |
| ampulla of Vater tumor        | 27 (3.7%)                    | 3 (3.2%)                    | NS    |
| sphincter of Oddi dysfunction | 15 (2.1%)                    | 1 (1.1%)                    | NS    |
| other                         | 14 (1.9%)                    | 5 (5.2%)                    | NS    |

Abbreviations: NS – non-significant

**PATIENTS AND METHODS** Retrospective analysis of medical records involved 821 patients treated in the Department of Gastrointestinal Diseases of Medical University of Łódź, who underwent ERCP in the years 2005–2007. In all patients abdominal ultrasonography had been performed earlier, 388 patients (47.3%) had also had computed tomography done, and 53 (6.5%) magnetic resonance cholangiopancreatography. Age, sex, indications for ERCP, its course and complication rate, and the mean hospital stay time were assessed in patients < and > 80 years of age. The results of laboratory tests were compared before ERCP and, if available, 24 hours after the procedure, and in case of complications also surgical records were analyzed. All ERCP procedures were performed by 2 experienced endoscopists (B. W. i M. P.).

According to the approved criteria, acute post-ERCP pancreatitis was diagnosed when clinical symptoms occurred simultaneously, mainly pain in the epigastric and periumbilical region, and over a 3-fold increase in the serum amylase level that persisted for >24 hours after the procedure.

Post-ERCP hemorrhage was diagnosed on the basis of clinical symptoms and a decrease in the hemoglobin level of at least 2 g/dl. Cases of bleeding that were only present during ERCP and could be followed without any clinical consequences, were not regarded as procedural complications. Perforation was suspected on the grounds of contrast medium leakage outside the bile and pancreatic ducts during ERCP.<sup>6,7</sup>

Data on 2 groups were compared using Student's t-test or the  $\chi^2$  test. The results were presented as mean  $\pm$  standard deviation, and a  $p < 0.05$  was considered significant.

**RESULTS** In the years 2005–2007 821 ERCPs were performed, including 241 procedures in 2005, 299 in 2006, and 281 in 2007. As few as 73 (8.9%) of ERCPs were only diagnostic procedures. The vast majority, 748 (91.1%) ERCPs were combined with sphincterotomy, gall stones removal or stent implantation into the common bile duct and/or the main pancreatic duct. In 16 patients, mainly women (87.5%), sphincter of Oddi dysfunction was suspected following ERCP. The indication for ERCP in this group of patients was suspected choledocholithiasis.

The patients studied were aged 16–96 years (mean  $63.12 \pm 15.10$  years). 96 procedures (11.7%) were performed in patients >80 years of age (81–96 years, mean  $85.07 \pm 3.76$  years), including 27 subjects in 2005, 33 in 2006, and 36 in 2007. The remaining procedures were performed in patients <80 (mean  $60.48 \pm 13.92$  years). In patients who underwent ERCP women definitely outweighed men (568 individuals, 69.2%). Among patients aged >80 years, the percentage of women was even larger; there were 78 females (81.2%) and only 18 males (18.8%) (TABLE 1).

Choledocholithiasis was the main cause for admission to hospital in both groups of patients, namely the younger ones and those >80 years of age (TABLE 2). Another admission causes represented bile duct strictures, pancreatic and ampulla of Vater tumors and hepatic hilus tumors. There was also no difference in the incidence of these diseases between the groups. In turn, chronic pancreatitis was diagnosed only in the patients ≤80 years. It is known that this disease affects mainly men, usually in the 4th or 5th decade of life. The mean age of participants of the current study hospitalized for chronic pancreatitis and underwent ERCP was 47.3 years (16–60 years).

The analysis of laboratory test results did not show any statistically significant differences between the two groups, both before ERCP and 24 hours after it. The comparison of laboratory test results is presented in TABLE 3.

Complications were observed in 48 (5.8%) out of 821 patients, including 44 subjects aged <80 (6.1%) and 4 >80 years (4.2%;  $p > 0.05$ ). The most common complication was acute pancreatitis that occurred in 34 patients. It was observed in 32 subjects ≤80 years of age (4.4%) and in 2 older individuals (2.1%,  $p > 0.05$ ). The occurrence of acute pancreatitis was associated with prolonged hospital stay in both younger and older (>80 years of age) patient groups up to 7.2 and 8.5 days, respectively. None of the patients required surgery.

Another complication, gastrointestinal hemorrhage, occurred in 12 patients, including 10 (1.4%) ≤80 years of age and 2 (2.1%) >80 years of age. In 6 subjects (4 ≤80 years, and 2 >80 years) there was a need for red blood cell mass transfusion (2–4 units). The time of hospital stay in patients with bleeding was 6.2 days for the younger subjects, and 6.5 days for those >80 years of age, which was not a significant difference.

**TABLE 3** The comparison of mean laboratory test values before and after ERCP in the study groups

| Variable                  | Before ERCP       |                   | p  | After ERCP        |                 | p  | Reference range |
|---------------------------|-------------------|-------------------|----|-------------------|-----------------|----|-----------------|
|                           | ≤80 years         | >80 years         |    | ≤80 years         | >80 years       |    |                 |
| Total bilirubin (mg/dl)   | 4.3<br>0.4–38.3   | 6.4<br>0.4–24.7   | NS | 4.1<br>0.3–28.8   | 3.6<br>0.4–19.7 | NS | 0.3–1.2         |
| AST (IU/l)                | 40.3<br>20–377    | 49.2<br>18–251    | NS | 40.4<br>15–253    | 39.9<br>21–291  | NS | 0–31            |
| ALT (IU/l)                | 67.3<br>12–520    | 44.75<br>12–187   | NS | 62.4<br>11–398    | 53.91<br>11–272 | NS | 0–31            |
| ALP (IU/l)                | 169.2<br>110–1324 | 257.91<br>110–768 | NS | 206.15<br>71–2766 | 177.2<br>84–914 | NS | 15–117          |
| GGTP (IU/l)               | 76.2<br>34–876    | 89.7<br>22–967    | NS | 51<br>22–899      | 60.5<br>26–654  | NS | 5–55            |
| WBC (10 <sup>3</sup> /μl) | 9.3<br>4.4–21.9   | 8.4<br>4.2–17.3   | NS | 7.6<br>4.4–16.8   | 7.1<br>4.3–12.4 | NS | 4–10            |

Abbreviations: ALP – alkaline phosphatase, ALT – alanine transaminase, AST – aspartate transaminase, GGTP – γ-glutamyltransferase, NS – non-significant, WBC – white blood cell count

On the other hand, perforation was suspected at 2 ERCP procedures (0.3%) in the group ≤80 years of age. These patients underwent surgical consultation and one of them was transferred to the Department of General and Transplant Surgery of the Medical University of Łódź. Finally, after conservative treatment both patients were discharged from hospital without surgery.

There was no allergic reactions to contrast media or anesthesia complications in available medical records. There was no fatal post-ERCP complications. The mean hospital stay period was 4.8 days for patients ≤80 years of age and 5.7 days for those >80 years (p >0.05; [TABLE 4](#)).

**DISCUSSION** The percentage of patients >80 years of age who underwent ERCP in the Department of Gastrointestinal Diseases is similar to that reported by other authors.<sup>8–11</sup> In the current analysis ERCP was mainly performed because of choledocholithiasis in both younger and >80 years old patients. Likewise, in the study by Köklü et al. choledocholithiasis was diagnosed in 52% of patients by the age of 69, and in 50.5% of older individuals.<sup>9</sup> In other studies choledocholithiasis was also the most common indication for ERCP in patients >80 years of age.<sup>10,11</sup> In the present study a statistically significant difference was observed only for the incidence of ERCP performed because of chronic pancreatitis. All ERCP procedures performed in the Department for this reason concerned patients <80 years, mean age 47.3 years (16–60 years). This age corresponds with the peak incidence of chronic pancreatitis, especially of alcoholic etiology. Over the age of 80 chronic pancreatitis is diagnosed significantly less frequently.<sup>12</sup>

The most common post-ERCP complication is acute pancreatitis. Its incidence is 1.3% to even 30% of cases.<sup>13–15</sup> In this study acute pancreatitis affected 4.4% of younger patients and 2.1% of subjects >80, with no statistically significant

intergroup difference. It is known that factors predisposing to this complication are female sex, young age, a history of recurrent pancreatitis and sphincter of Oddi dysfunction.<sup>15</sup> Therefore, in elderly patients this complication is usually rarely reported. The risk of acute pancreatitis after ERCP also increases following administration of large amounts of contrast medium, multiple cannulation attempts and manipulations in pancreatic ducts.<sup>14,15</sup>

Another complication, gastrointestinal hemorrhage, occurs most often after ERCP with endoscopic sphincterotomy, and its incidence has been estimated at 1–5% up to 10–30% of patients.<sup>14,15</sup> The results of this study demonstrated that bleeding occurred in 1.5% of all patients who underwent ERCP in the years 2005–2007. Its incidence in elderly subjects was not higher, which is in line with results of other studies.<sup>9–11</sup>

Perforation of digestive tract is a rare but severe complication of ERCP. Its occurrence depends on the anatomy of distal segment of the common bile duct and the length of major duodenal papilla cut. The factors predisposing to this complication involve Billroth II gastrectomy, endoscopic sphincterotomy, intramural injection of contrast medium and dilation of bile duct stricture.<sup>1,16</sup> In the study by Enns et al. the patient's advanced age was also recognized an independent risk factor for perforation, which occurred in patients about 10 years older than the rest.<sup>16</sup> In contrast, the analysis of ERCP performed in the Department showed that perforation affected only 2 patients who belonged to the younger group (≤80 years). In most studies conservative therapy was sufficient and patients, like in the present study, did not require surgical intervention.<sup>7,16</sup> Comparative analysis of complication incidence showed that ERCP is a safe procedure regardless of the patient age.<sup>9–11,17–19</sup> Another conclusion from this study is that the mean time of hospital stay was similar in both groups, being 4.8 days for patients

≤80, and 5.7 days for those >80 years of age. Likewise, the study by Katsinelos et al. conducted in 2 age groups, 70–89 years and >90 years old, did not show any differences between efficacy of ERCP and its complication rate that allows regarding this procedure as safe.<sup>17</sup>

It should be emphasized that the success of ERCP is conditioned by its performance by an experienced endoscopist, anesthesia by an experienced anesthetist, and by avoiding longer procedure by multiple cannulation attempts and pancreatic duct manipulations.<sup>20</sup> To sum up, the authors believe that choice of the most favorable management for an individual patient, together with the appropriate preparation and monitoring during the procedure, ensure safety also for the patients >80 years of age.

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