

Abstract

Background: This scoping review aims to calculate the frequency of the endoscopic retrograde cholangiopancreatography (ERCP) single-use device usage for diagnostic and therapeutic procedures of patients with pancreaticobiliary diseases, to investigate the characteristics of patients undergoing ERCP with single-use devices and to analyze the relation between clinical indications and procedure outcomes with single-use device employment.

Materials and Methods: This scoping review was written in accordance with PRISMA guidelines. MEDLINE via PubMed, EMBASE, and SCOPUS databases were used for the literature search. Patients older than 18 years with no surgically altered anatomy, indicated with pancreaticobiliary disorders, who were diagnosed or treated by ERCP procedures used ERCP single-use devices, were included in the scoping review. Articles published in English and based on data from patient samples of $n > 50$ in Europe, Canada, or the USA from 2012 until 2022 were included. For all the reported procedures, the number of intended devices per patient and the number of devices per procedure were calculated as a minimum, maximum, and median and if there are more than 5 studies included per procedure group, the interquartile range (IQR) was calculated.

Results: There were 103 included studies reported on the ERCP procedures of biopsy, cannulation, sphincterotomy, papillectomy, metallic and plastic stenting, dilation with a balloon, stone extraction basket and balloon, mechanical lithotripsy, peroral cholangioscopy, stone destruction with electrohydraulic lithotripsy (EHL), radiofrequency ablation and argon plasma coagulation. There were randomized – controlled studies, cohort studies, case-control studies, cross-sectional studies, and comparative and observational studies included. The largest number of studies were reported on plastic stenting. Among all the studies, patients were predominantly older than 60 years old. The share of females across the studies was almost equal to half of the patients across the ERCP procedures (median 46% - 56%). The most frequent clinical indication was pancreaticobiliary (PB) benign or malignant strictures and choledocholithiasis, where choledocholithiasis was slightly less frequently indicated as a reason for ERCP. The main purpose of ERCP was therapeutic operations. In every study, at least one patient has been reported with post-ERCP inflammation adverse event. The results showed the median of the device usage per patient or per procedure was equal to 1, but the IQR calculation showed the usage of devices in the range of 1 to 2.3 per patient or per procedure.

Discussion: This scoping review provides the preliminary number of the single-use ERCP device usage per patient and per procedure but does not generalize the results for the broader population. This review supports the existing data on the most frequent clinical indication for ERCP procedure, which is biliary or pancreatic strictures. The research findings can be applicable for the future trend analysis as an empirical foundation of the device management by means of synthesis of the projection model. The future research on the single-use ERCP devices should be conducted with the involvement of the expertise of clinical specialists in the field of interest. As well, focused on analyzing the clinical studies based on the country of interest to synthesize the projection model of the device usage volume per country. Higher number of studies included in the further review is required, especially RCTs.