

Cost Based Analysis of Risk Stratification Tool for Prediction and Management of High Risk Choledocholithiasis Patients

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Abstract : Background: Choledocholithiasis is a common complication of gallstone disease. Risk scoring systems exist to guide the need for further imaging or endoscopy in managing choledocholithiasis. We completed an audit to review the American Society for Gastrointestinal Endoscopy (ASGE) scoring system for prediction and management of choledocholithiasis against the current practice at a tertiary hospital to assess its utility in resource optimisation. We have now conducted a cost focused sub-analysis on patients categorized high-risk for choledocholithiasis according to the guidelines to determine any associated cost benefits. Method: Data collection from our prior audit was used to retrospectively identify thirteen patients considered high-risk for choledocholithiasis. Their ongoing management was mapped against the guidelines. Individual costs for the key investigations were obtained from our hospital financial data. Total cost for the different management pathways identified in clinical practice were calculated and compared against predicted costs associated with recommendations in the guidelines. We excluded the cost of laparoscopic cholecystectomy and considered a set figure for per day hospital admission related expenses. Results: Based on our previous audit data, we identified a 77% positive predictive value for the ASGE risk stratification tool to determine patients at high-risk of choledocholithiasis. 47% (6/13) had an magnetic resonance cholangiopancreatography (MRCP) prior to endoscopic retrograde cholangiopancreatography (ERCP), whilst 53% (7/13) went straight for ERCP. The average length of stay in the hospital was 7 days, with an additional day and cost of £328.00 (£117 for ERCP) for patients awaiting an MRCP prior to ERCP. Per day hospital admission was valued at £838.69. When calculating total cost, we assumed all patients had admission bloods and ultrasound done as the gold standard. In doing an MRCP prior to ERCP, there was a 130% increase in cost incurred (£580.04 vs £252.04) per patient. When also considering hospital admission and the average length of stay, it was an additional £1166.69 per patient. We then calculated the exact costs incurred by the department, over a three-month period, for all patients, for key investigations or procedures done in the management of choledocholithiasis. This was compared to an estimate cost derived from the recommended pathways in the ASGE guidelines. Overall, 81% (£2048.45) saving was associated with following the guidelines compared to clinical practice. Conclusion: MRCP is the most expensive test associated with the diagnosis and management of choledocholithiasis. The ASGE guidelines recommend endoscopy without an MRCP in patients stratified as high-risk for choledocholithiasis. Our audit that focused on assessing the utility of the ASGE risk scoring system showed it to be relatively reliable for identifying high-risk patients. Our cost analysis has shown significant cost savings per patient and when considering the average length of stay associated with direct endoscopy rather than an additional MRCP. Part of this is also because of an increased average length of stay associated with waiting for an MRCP. The above data supports the ASGE guidelines for the management of high-risk for choledocholithiasis patients from a cost perspective. The only caveat is our small data set that may impact the validity of our average length of hospital stay figures and hence total cost calculations.

Keywords : cost-analysis, choledocholithiasis, risk stratification tool, general surgery

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