An Evidence -Based Approach to Nursing Recognition and Management of Early Sepsis in Percutaneous Transhepatic Biliary Drainage (PTBD)

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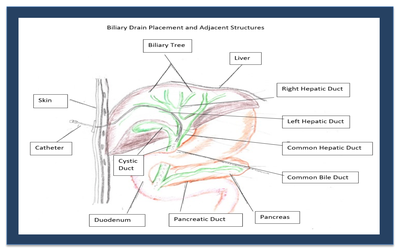
Introduction

Percutaneous Transhepatic Biliary Drainage (PTBD) is an interventional radiology procedure that is indicated for relief of biliary obstructive symptoms: pruritus, jaundice and cholangitis caused by benign or malignant conditions. Gallstones, cholangiocarcinoma and hepatobiliary malignancies are frequently seen.

Although PTBD is generally a safe procedure, significant complications may manifest as systemic inflammatory response syndrome (SIRS) that could lead to mortality. Early post anesthesia care unit (PACU) nursing recognition is critical in effectively managing these vulnerable patients.

Practice Question

What is the best practice for patients post biliary drain placement presenting symptoms of systemic inflammatory response syndrome (SIRS)? **(P)** Patients post PTBD; **(I)** Early recognition of SIRS; **(C)**Prompt/early management of SIRS compared to standard care in mitigating sepsis **(O)**



Common Areas For Release of Endotoxins

Search Strategy

The evidence-based practice (EBP) searches were conducted using the PUBMED and CINAHL database. The following Mesh terms were used: interventional, biliary drainage, PTBD, pathophysiology, cholangitis, symptoms, complications, sepsis and SIRS. The evidence reviewed ranged from 2013 to 2019. From the PUBMED and CINAHL data bases, the first search yielded 8 articles out of 36 articles that met the PICO criteria. The second and final search included additional terms of mortality and patient outcomes.

Level and Quality of Included Evidence

Date: October 2019		EBP Question: Best practice for patients post PTBD placement using algorithm for early recognition/management of SIRS compared to standard care for mitigating sepsis?					
Article Number	Author and Date	Evidence Type	Sample, Sample Size, Setting or Not Applicable	Findings That Help Answer The EBP Question	Observable Measures	Limitations	Evidence Level, Quality
1	Yu 02-20-2019	Qualitative	694 patients with malignant biliary obstruction who had PTBD inTianjin Medical University Cancer Hospital	The prevention and therapeutic strategies should be developed and improved according to the related risk factors.	Compared the impacts of different factors on biliary infection during operation	The study is retrospective design and data from a single-centre setting.	III A- High
2	Kim 09-28-2018	Quality Improvement	N/A	The implementation of sepsis bundles is a cornerstone of sepsis performance improvement programs. Prevention and early recognition of sepsis and application of optimal treatments and improved compliance with sepsis bundles are pre-requisites for improving patient outcomes.	Examine of workflows, protocols Reports of organizational experience and expert opinions		V A-High
3	Bornman 2003	Integrative Review	N/A	Stepwise management algorithm emphasizes different treatment strategies according to the underlying cause and level of obstruction based on current evidence-based data.	Review of evidence and literature Expert opinion	Retrospective design; patients with preprocedural; cholangitis were excluded from the data	III A-High
4	Motte 05-2017	Quantitative	347 patients underwent biliary endoprosthesis placement between October 1984 and December 1988, of which 34 patients experienced septicemia as documented by positive blood culture within 3 days after procedure; From the remaining 313, every third patient was selected as control group at the Department of Gastroenterology	The study suggested using the quality of drainage as a risk for septicemia and draw an algorithm for antibiotic prophylaxis before ERCP in obstructed patients.	Reviews of records to formulate facts and use of statistical data analysis	A single case presentation.	II-High
5	Ramchandani 02-14-2017	Qualitative	N/A	Identifiable and correctable risk factors for cholangitis should be treated to reduce recurrence. Biliary decompression increases antibiotic penetration in bile. Therefore., patients with high risk factors and organ dysfunction require early and urgent biliary drainage	Case report		III B=Good
6	Yarmohammadi 09-30-2016	Review of Literature	N/A	If a patient develops fever and/or chills following biliary intervention, antibiotics may be continued, fluid rescucitation should be initiated and the need for blood culture considered.	Experience, opinion, thoughts of the author		V-Good
7	Torsvik 2016	Quantitative	472 pre-intervention and 409 post-intervention patients were admitted in one emergency hospital in Norway.	Early sepsis recognition identified by observations of vital signs and detection of organ failure may reduce progression of disease and improved survival for patients in hospital with sepsis. A sepsis flowchart alert and treatment system can be used to guide forefront nurses in sepsis identification which may lead to increased survival, decreased occurrence of severe sepsis or septic shock, and shorter length of stay or no need to stay in the critical care unit.	Retrospective collection and review of data and statistical analysis	Use of historical pre-intervention group which does not ensure comparability between pre and post intervention groups As an observational study, the was no control for a natural decline in mortality over the time. The study included patients with evident bacteremia only thus, a considerable proportion of patients with sepsis may b]have been left out	II A-High
8	Smith 2004	Clinical Practice Guidelines	N/A	The keys to treating acutely septic patients in interventional radiology are to identify those at risk, to understand the basic treatment principles, and to have initiated treatment plans regarding patient care before the acute event. An attempt to outline the factors hopes to provide a patient care framework.	Context		IV B-Good
9	Alsolamy 2014	Quantitative	Prospective consecutive series of all adult patients presenting to the ED from Oct 1, 2012 to Jan. 31, 2013. The study excluded patients younger than 14 year of age. A 4-month study period with 49, 838 presented to the ED, 220 were identified to have severe sepsis or septic shock.	An electronic alert preceding ICU referral could lead to earlier sepsis management and minimize delays in recognizing sepsis.	Collection, analysis and reporting of numerical and observed effects of the screening tool. Use of statistical analysis	Single-center study Described only the characteristics of patients who ere admitted to the ICU The alert system scans the most recent vital signs for sepsis criteria which decrease the trigger threshold as all criteria must be aligned at the same time	II A-High
10	Gavazzi 2016	Qualitative	180 patients who had pancreaticoduodenectomy an intraoperative bile cultures performed in Humanitas Research Hospital, Rozzano, Italy	It is desirable to develop guidelines to standardize treatment and care . Patients with bilary stents placed for obstructive jaundice and preoperative infected bile, an antimicrobial therapy with anti-enterococcal activity should be chosen for prophylaxis	Cases, analysis	Single-centre observational retrospective study	III A-High
11	Murtha 08-19-2017	Integrative review	N/A	The systemic inflammatory response syndrome (SIRS) criteria have been used since 1991 as a means of identifying patients with possible sepsis. It is essential to have a protocol for nurses to alert physicians for quick assessment and administration of antibiotics and fluids to septic patients	Cases, context, thoughts		V A-High
12	Kimura 2007	Expert opinion	N/A	Variations in the treatment and risk factors influencing the mortality rate indicate the necessity for standardized diagnostic, treatment and severity assessment criteria.		Experience, context	V B-Good

Synthesis

The evidence-based review revealed compelling science for a change for post anesthesia care unit (PACU) nurses recognizing and managing early SIRS in patients who are having the interventional radiology procedure PTBD. Since the biliary interventional procedure decompresses the obstructed biliary system that allows physiological flow with the bile drainage, endotoxins activate the systemic inflammatory response causing acute infection that could lead to sepsis.

Team created an EBP algorithm that was effective for PACU nurses in early recognition of SIRS and prompt PACU nursing management to mitigate deteriorating symptoms of increased heart rates and rigors followed by fevers to improve quality patient care.

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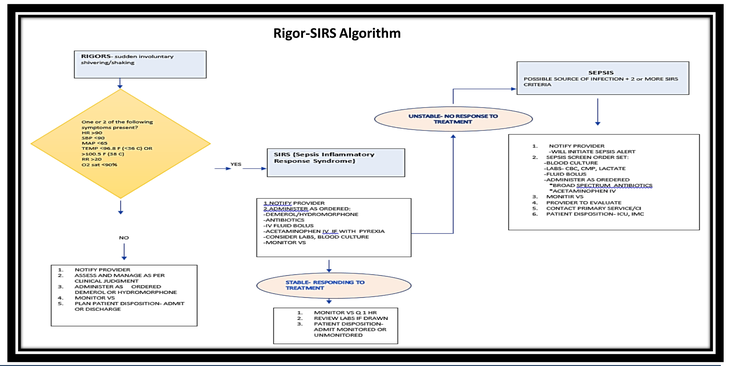

Recommendations for Translation into Practice

Post PTBD SIRS can be challenging for PACU nurses to manage life-threatening complications. Evidence supports the development of an algorithm tool that focuses on recognition, assessment, and appropriate management of SIRS in this population. The science recommends easy accessibility of standing physician order sets, including medications, such as intravenous (IV) fluids, IV antibiotics, and acetaminophen as SIRS management in PACU strategies to facilitate positive patient outcomes.