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Encore 1

Title: Assessing the use of multi modal analgesia in post-operative total joint replacement patients at a tertiary academic center

Submitting Author: Mphamvu Kalengamaliro, PharmD Candidate

Abstract:
Purpose: Amidst the ongoing opioid epidemic there has been a further need to evaluate effective methods for pain management with decreased opioid involvement. In patients that have undergone total joint arthroplasty (TJA), adequate pain management is an integral component to recovery. Implementation of multimodal perioperative regimens in TJA has shown to shorten hospital length of stay and improve pain control. In addition, multimodal perioperative regimens have shown a reduction in total opioid consumption during admissions along with less medication-related adverse effects. The purpose of this study was to evaluate the pain acceptability reported by patients who received scheduled multimodal postoperative analgesia following TJA at Rush University Medical Center, compared to those who received unimodal post-operative pain management.

Methods: This is an institutional review board approved single-center, retrospective, observational study that evaluated an inpatient multimodal postoperative analgesia protocol used in patients who have undergone TJA. Patients (aged 18 and above) who underwent primary TJA from November 2016 to April 2017 prior to multimodal pain protocol implementation were compared to those who underwent primary TJA from September 2017 to February 2018 after the initiation of the multimodal pain management implementation. Chronic pain patients, patients with chronic end stage renal disease, and pregnant patients were excluded from this study. Data was collected from electronic medical record system. A sample size of 195 patients in the unimodal pain management group and 200 patients in the MMA group were evaluated. The primary endpoint was pain acceptability, which was defined as: whether or not patient rated their pain as acceptable upon the Defense & Veterans Pain Rating Scale (DVPRS) assessment. Secondary endpoints of this study included hospital length of stay, post-operative opioid consumption, antiemetic use and patient perception of pain management during their hospital stay. Data was evaluated using an unpaired t-test and Mantel-Haenszel chi square test. Primary and secondary outcomes are reported using a two-sided p-value and a 95 percent confidence interval.

Results: For patients in the MMA group, preliminary results showed a significant difference in pain control on post-operative day one (p equals 0.04, 95 percent CI, 1.01 percent to 1.22 percent) in addition to decreased hospital length of stay (p equals 0.0001, 95 percent CI, 0.44 percent to 0.77 percent). The opioid consumption in the MMA group was decreased by half compared to the unimodal pain management that was used prior to implementation of the MMA protocol.

Conclusion: The implementation of the MMA protocol at this institution has led to improved post-operative pain control, decreased length of stay and decreased opioid consumption in TJA patients.

Organization: Rosalind Franklin University of Medicine and Science

Authors: Mphamvu Kalengamaliro, Pharm D Candidate; Skyler Boll, PharmD Candidate; Alifiya F. Hyderi, PharmD, BCPS, Rush University Medical Center, Chicago, IL

Encore 2

Title: Comparison of Angiotensin Converting Enzyme Inhibitor vs. Sacubitril/valsartan in Patients with Heart Failure with Reduced Ejection Fraction: A Retrospective Study

Submitting Author: Vincent Chau, PharmD Candidate

Abstract:
Purpose: The 2017 ACC/AHA/HFSA Heart Failure Guidelines recommend patients with chronic symptomatic heart failure with reduced ejection fraction (HFrEF) tolerating an angiotensin converting enzyme inhibitor (ACEi) or angiotensin II receptor blocker (ARB) replace the ACEi or ARB with an angiotensin receptor neprilysin inhibitor (ARNI). This is based off of the PARADIGM-HF study that compared sacubitril/valsartan vs. enalapril 10 mg twice daily. The study's limitations include strict inclusion criteria and submaximal target dose for enalapril. The purpose of this study is to further evaluate morbidity and mortality outcomes between sacubitril/valsartan and ACEi in patients with HFrEF in a real world setting.

Methods: We performed a single-center retrospective chart review to compare clinical outcomes with treatment of ACEi vs. valsartan/sacubitril in patients hospitalized with HFrEF from December 2017 to May 2019. The protocol was approved by institutional and university institutional review boards. Data was collected from the electronic health record and was inputted into Microsoft Excel. A separate coding sheet was utilized to protect PHI. Patients were included if they were admitted to the hospital, had a diagnosis of heart failure with reduced ejection fraction (HFrEF) and received either sacubitril/valsartan or an ACEi during the hospital encounter and at discharge. Data was collected in 77 patients in the sacubitril/valsartan group and 77 patients in the ACEi group, matched by month of admission. The primary outcome was a composite endpoint of cardiovascular death and hospitalizations due to HF exacerbation. Secondary outcomes were total number of hospitalizations due to a heart failure exacerbation and average time to subsequent hospitalizations. Safety outcomes were angioedema, hypotension, and acute kidney injury. The primary outcome and safety outcomes were analyzed by chi-squared test and secondary outcomes were analyzed by unpaired t-test.

Results: Seventy-seven patients were included in each group. There were 28.6% of patients in the sacubitril/valsartan group and 35.1% patients in the ACEi group who experienced the primary outcome ($p = 0.489$). The incidence of cardiovascular death was 6.5% in the sacubitril/valsartan group and 9.1% in the ACEi group ($p = 0.765$); all-cause mortality rates were 9.1% in sacubitril/valsartan group and 10.4% in the ACEi group ($p = 1.000$). The incidence of hospitalization due to a heart failure exacerbation was 24.6% in the sacubitril/valsartan group and 32.5% in the ACEi group ($p = 0.373$). The total number of subsequent hospitalizations due to a heart failure exacerbation after being included in the study was 31 hospitalizations (0.40 hospitalizations per patient) in the sacubitril/valsartan group and 42 hospitalizations (0.55 hospitalizations per patient) in the ACEi group ($p = 0.353$). Of the patients who were hospitalized due to a heart failure exacerbation, the average time to hospitalization was 78.8 days in the sacubitril/valsartan group and 100.7 days in the ACEi group ($p = 0.401$). There were 37.7% of patients in the sacubitril/valsartan group and 42.9% of patients in the ACEi group who experienced at least one of the safety outcomes ($p = 0.622$).

Conclusion: Sabubitril/valsartan did not result in a significantly lower rate of cardiovascular deaths and hospitalizations due to a heart failure exacerbation compared to ACEi in our real world group of patients with HFrEF. There was no statistically significant difference in rates of adverse events between the two groups. Further research is warranted to assess outcomes between these treatments in a real world setting, including assessing potential effects of attempted titration to target dosing.

Organization: Southern Illinois University Edwardsville

Authors: Vincent Chau, SIUE; Jared Sheley, PharmD, SIUE

Encore 3

Title: Enoxaparin anti-factor Xa level monitoring and coinciding dose adjustments

Submitting Author: Blake Lutzow, PharmD Candidate

Abstract:
Purpose: Anti-factor Xa level monitoring for enoxaparin is not usually recommended in the general population. In certain populations with obesity or renal impairment, it may be a useful tool to ensure safety of preventing bleeding and efficacy of therapeutic treatment doses. The purpose of this study was to evaluate the utility of anti-factor Xa monitoring and its impact on current practice.

Methods: The institutional review board approved this single centered retrospective review of anti-factor Xa levels and enoxaparin dosing. Patients 18 years and older who were admitted to the hospital between June 1, 2016 and June 1, 2019 and had an anti-factor Xa level checked while receiving enoxaparin were included in the study. Patients were excluded from the study if they were using any anticoagulant other than enoxaparin at the time of anti-factor Xa monitoring, if they were being treated for acute coronary syndrome, or if they were undergoing a percutaneous intervention. The primary outcome was to identify the appropriateness of anti-factor Xa levels drawn and what dose changes coincide with the resulting level. Secondary outcomes include the appropriateness of initial dose, reason for anticoagulation, risk factors for development of venous thromboembolism, and adverse effects including bleeding and thrombosis. Descriptive statistics were performed on the data.

Results: Eighty-seven patients were included in the primary evaluation and twenty-two patients were excluded due to use of other anticoagulants not including enoxaparin. The patients included were using anticoagulation for deep vein thrombosis, pulmonary embolism, both deep vein thrombosis and pulmonary embolism, atrial fibrillation, venous thromboembolism prophylaxis, and various other disease states. Due to readmissions among the eighty-seven patients, there were ninety-three eligible anti-factor Xa levels drawn. Obesity was the most common risk factor present in patients who had an anti-factor Xa level checked with 77% (67/87) of patients being obese. Patients with renal dysfunction defined as creatinine clearance of less than 30 ml/min at the time of anti-factor Xa draw represented 7% (6/87) of the patient population. Only 32% (30/93) of the initial anti-factor Xa tests performed were within the recommended time range of 4-6 hours after a steady state dose. Dose changes occurred after an anti-factor Xa level draw 24% (22/93) of the time. Dosage adjustments were appropriate 31% (29/93) of the time and inappropriate 18% (17/93) of the time.

Conclusion: The results of this study show that anti-factor Xa levels are not always effectively monitored and utilized. Anti-factor Xa level monitoring resulted in a change in therapy 24% of the time when a level was drawn. More evidence is needed to determine what patient specific factors should warrant an anti-factor Xa level. There is an opportunity to educate providers and pharmacists to improve timing of levels and utilization of the level to improve patient care.

Organization: Southern Illinois University Edwardsville School of Pharmacy

Authors: Blake, J, Lutzow, Pharm.D. Candidate class of 2020 Southern Illinois University Edwardsville school of pharmacy; Carrie, Vogler, Pharm.D., BCPS Clinical Associate Professor, Memorial Medical Center

Encore 4

Title: Impact of hormone replacement therapy on patients with endometrial cancer

Submitting Author: Priya Patel, PharmD Candidate

Abstract:
Purpose: Hormone replacement therapy (HRT) is crucial for alleviating symptoms in endometrial cancer survivors who experience natural and/or surgically induced menopause. However, many providers hesitate to prescribe HRT to endometrial cancer survivors due to the misinterpretation that hormone therapy may increase the risk of recurrence of cancer. This study was designed to analyze the HRT use in recent studies to relief menopausal symptom and whether it may increase the risk of recurrence of endometrial cancer.

Methods: This study included a total of 20 global studies that were found using specific terminology from numerous databases. Eleven of the studies met the inclusion criteria. These global studies were conducted in North America, Asia, and Europe in the past two decades. The study designs included randomized control trials, meta-analyses, article reviews, matched control studies, and retrospective and prospective case controls. The study participants included women underwent hysterectomy and survived endometrial cancer. The primary outcome of the study was to examine the impact of HRT on the frequency of recurrence in women who survived endometrial cancer and the secondary outcome was the impact of hormone replacement therapy to reduce the symptoms of menopause among women who survived endometrial cancer. In addition, economic and humanistic outcomes were also assessed using the Economic, Clinical, and Humanistic Outcomes (ECHO) model.

Results: 13,240 patients were evaluated from the nine studies that were included. The majority of the clinical studies showed no significant increase in recurrence of endometrial cancer in patients using HRT compared to the control group. Moreover, multiple studies revealed a longer disease-free interval rate among patients who used HRT compared with patients in the control group. One study reported a protective effect showed in cancer survivors who used a combination of estrogen and progestin as opposed to using one drug alone for symptom control. Although there were fewer studies which focused on economic and humanistic outcomes, the following findings were observed: economically, the use of HRT for menopausal symptom relief is cost-effective using quality-adjusted life year. There is a lack of specific studies on the cost-effectiveness of HRT use among endometrial cancer survivors. There is limited research on assessing humanistic outcomes among cancer survivors who are using HRT; however, these studies showed an improved quality of life among post-menopausal women who use HRT.

Conclusions: Based on the findings of this study, there is a lack of evidence to support linking the use of hormone replacement therapy is directly linked to an increased rate of recurrence of endometrial cancer among survivors. Closing the gap in education is needed to ensure that endometrial cancer survivors receive the

optimal care to improve their outcomes. Pharmacists are poised to provide counseling on the appropriate use of HRT. For future research, it may be beneficial to conduct more studies on economic and humanistic outcomes using the ECHO model.

Organization: Roosevelt University College of Pharmacy

Authors: Priya A. Patel, PharmD Candidate 2021, Roosevelt University College of Pharmacy, Student Intern at Walgreens; Swetha E. Sajan, PharmD Candidate 2021, Roosevelt University College of Pharmacy, Student Intern at Walgreens; Abby A. Kahaleh, PhD, MS, BPharm, MPH, Roosevelt University College of Pharmacy

Encore 5

Title: Measuring the Accuracy of Pathogen Identification and Resistance between Genetic (PCR) Technology vs Standard Culture ID/Susceptibility in Bloodstream Infections

Submitting Author: Corey Wachter, PharmD Candidate

Abstract:
Purpose: Rapid diagnostic technology for bloodstream infections is an area of growing interest in infectious diseases. The primary objective was to evaluate the accuracy of a multiplex polymerase chain reaction system (rapid PCR technology for species identification plus genetic resistance markers) in comparison to the current gold standard for culture/susceptibility testing (automated susceptibility testing), with a focus on Staphylococcus species and the presence/absence of methicillin resistance. The multiplex PCR results are completed in two hours, whereas the current standard can take up to three days for cultures/sensitivities. This reduced turnaround time may result in improved patient care and cost savings.

Methods: This was an IRB approved, retrospective analysis that assessed blood culture results that were collected from May 1st, 2018 to April 30th, 2019. Inclusion criteria consisted of samples with both PCR results from the multiplex PCR system in addition to standard cultures/susceptibilities from automated susceptibility testing. There was no limit to the age range of patients included. Results from the PCR system were compared for appropriate identification of the pathogen and the appropriate resistant genes/susceptibilities. The main focus was on the detection/absence of the mecA gene by the PCR, which is a gene that codes for methicillin-resistance in Staphylococcus species. The multiplex PCR system is capable of detecting the mecA gene, which clinically correlates with the culture/susceptibility report from the automated susceptibility testing as resistant to methicillin/oxacillin. Isolates that were mismatched between the results (eg: PCR result showed "Staphylococcus aureus, no mecA detected" and the automated susceptibility testing resulted as "Staphylococcus aureus, resistant to methicillin") were labeled as a mismatch. Patients with multiple admissions/blood samples in a single admission were counted as individual samples. The total number of mismatches was calculated and the final rates of mismatches were calculated for both Staphylococcus aureus and coagulase negative staphylococci.

Results: There were 913 positive blood cultures that had both rapid diagnostic results and the standard cultures/susceptibilities. Of those 913 cultures, 120 were identified as Staphylococcus aureus and 361 were

identified as coagulase negative Staphylococcus species. S. aureus was (120/120) 100% accurate between both systems. The greatest amount of mismatches between the multiplex PCR and automated susceptibility testing occurred with coagulase negative Staphylococcus species (26/361, 7.2%). The breakdown of the mismatches was as follows: methicillin resistant cultures/susceptibilities with no resistant mecA gene detected from the PCR machine (10/26, 38.5%), methicillin susceptible cultures/susceptibilities with a resistant mecA gene detected on PCR (10/26, 38.5%), polymicrobial results with resistant and susceptible strains found by the automated susceptibility testing (6/26, 23.1%). Overall, the mismatch rate for S. aureus was 0% (100% accurate) and between coagulase negative Staphylococcus species was 7.2% (92.8% accurate) between the PCR technology and the culture/susceptibility results.

Conclusion: Rapid diagnostic testing with the multiplex PCR system is able to detect resistant Staphylococcus species at a similar rate to the standard automated susceptibility testing. Rates of accuracy for S. aureus isolates were 100% between the PCR and the culture/susceptibility systems and 92.8% for coagulase negative Staphylococcus species. The mismatch rate for S. aureus was 0% and the mismatch rate for coagulase negative Staphylococcus species was 7.2%.

Organization: SIUE School of Pharmacy

Authors: Corey Wachter, SIUE School of Pharmacy, PharmD Candidate; Sameer Nagamiyan, SIUE School of Pharmacy, PharmD Candidate; Natalie Tucker, PharmD, BCPS, BCIDP, HSHS St. John's Hospital; Beth Cady, PharmD, BCPS, HSHS St. John's Hospital, SIUE School of Pharmacy

Encore 6

Title: Real-world Observation of DOAC treatment failures in extreme obesity

Submitting Author: Ammie Hodges, PharmD

Abstract:
Purpose: To answer the research question: What is the rate of readmission related to bleed or thrombosis in patients on DOACs with a BMI above 40 kg/m2?

Methods: All adult patients on a DOAC during hospitalization from January 1 to June 30, 2017 were evaluated. Charts were reviewed for all patients with a BMI above 40 kg/m2. Specific DOAC, indication, readmissions within one year, and reasons for readmission including bleed or thrombosis were recorded.

Research in Progress Conclusions: Our continued goal is to raise our provider's vaccination rates to national benchmark levels by persistently engaging our physicians and offices with education and validated best practices to improve HPV vaccination. Implications to pharmacy practice: The pharmacist is well-known at being adept at multilevel communication to a varied audience: parents, patients and providers. Pharmacist are valued members of the healthcare team should have an active role in population health initiatives. Our project's initial beginnings were incited by an HPV Vaccination Presentation given by our pharmacist during a Quarterly

Ambulatory Pharmacy and Therapeutics Subcommittee meeting. The topic spurred the interest of one of our Pediatrician members who was surprised at how low our HPV immunization rates were based on commercial claims data. Future evolution of our project will be focusing on ensuring patients complete vaccination series (2-doses) by age 13.

Results: 63 of the 422 patients receiving a DOAC had a BMI above 40 kg/m2. Of these, 12 (19%) were prescribed apixaban, five (8%) dabigatran, and forty-six (73%) rivaroxaban. Indications included atrial fibrillation or flutter (44%), treatment or history of venous thromboembolism (43%), and venous thromboembolism prophylaxis (13%). Twenty (32%) patients with a BMI above 40 kg/m2 were readmitted within one year, however none (0%) of the readmissions were related to bleed or thrombosis.

Conclusion: The 0% readmission rate related to bleed or thrombosis in patients with a BMI above 40 kg/m2 is lower than anticipated when compared to DOAC treatment failure rates published in the literature. However, the population studied was small and treatment failure can occur outside hospital admission. Though these findings cannot be extrapolated to predict long-term outcomes in extremely obese patients treated with DOACs, they do highlight the need for additional research in this patient population.

Organization: SwedishAmerican Hospital

Authors: Erin Carson, PharmD., Clinical Assistant Professor UIC College of Pharmacy at Rockford, Rockford, IL; Ammie Hodges, PharmD, Clinical Pharmacist, SwedishAmerican Hospital, Rockford, IL; Trevor Luman, PharmD, Pharmacist, OSF Healthcare, Peoria, IL; Thomas Carey, PharmD, Pharmacy Director, SwedishAmerican Hospital, Rockford, IL Thomas Carey