OUR LADY OF THE LAKE RMC

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Attainment of Therapeutic Anti-Xa Levels in Morbidly Obese Patients Receiving Enoxaparin

By Christopher Kennie-Richardson

There is a limited amount of available literature related to the proper dosing of enoxaparin in morbidly obese patients. This is primarily due to the fact that obese patients are often excluded from clinical trials. The lack of clinical evidence and consensus for a standardized approach for dosing of enoxaparin in this patient population has led to poor clarity regarding which dosing regimen is most appropriate. The goal of this project was to evaluate the required enoxaparin dose and time to reach therapeutic anti-Xa levels in morbidly obese patients.

The study was a single center, retrospective, electronic review of patient charts from April 2017 to October 2018. Eligible patients included individuals aged ≥ 18 years of age with a body mass index (BMI) ≥ 35 kg/m^2 or total body weight (TBW) ≥ 150 kg and having received treatment doses of enoxaparin. Data was collected on the initial enoxaparin dose, initial anti-Xa level, enoxaparin dose at goal anti-Xa level, and the time (in days) to reach therapeutic anti-Xa levels. Descriptive statistics were utilized in the analysis of data.

A total of 82 patients met inclusion criteria. The most common indications were treatment of deep vein thrombosis (28%), pulmonary embolism (24%), and atrial fibrillation (24%). Nine of eighty-two patients (11%) had anti-Xa levels monitored. Of those 9 patients with monitored levels, 1 of 9 received once daily dosing and 8 of 9 received twice daily dosing.

The one patient receiving once daily dosing had an initial level which was subtherapeutic and no further levels were ordered. Further review of those receiving twice daily dosing revealed that 2 of 8 (25%) had therapeutic initial anti-factor Xa levels, 3 of 8 (37.5%) had subtherapeutic initial levels, and 3 of 8 (37.5%) had supratherapeutic initial levels. Therapeutic levels were attained in an average of 2 days in the therapeutic group, an average of 3.5 days in the subtherapeutic group, and an average of 4.7 days in the supratherapeutic group.

Results showed that there is currently a low rate of enoxaparin therapeutic monitoring at our institution. The time to reach goal anti-Xa level was greatest in those with supratherapeutic initial levels. The most appropriate dose needed to attain therapeutic levels was not determined due to the limited number of patients with anti-Xa levels monitored. However, this may provide us with an opportunity to consider implementing automatic consults for anti-Xa monitoring in morbidly obese patients receiving treatment doses of enoxaparin. This could potentially allow for the conduction of a follow up study with an increased study population.

Evaluation of Alcohol Withdrawal Management and Prescribing Practices in the Trauma-Neuro Critical Care and Medical Intensive Care Units

By Mackenzie Piche`

OLOL does not utilize a standardized symptom-based assessment tool in order identify and treat adult patients with acute alcohol withdrawal syndrome (AWS) currently; although it is widely accepted that symptom-based administration of benzodiazepines is the standard of care. Studies have suggested that implementation of a symptom-triggered alcohol withdrawal protocol may decrease benzodiazepine usage, rates and duration of mechanical ventilation, and intensive care unit length of stay. The purpose of this single-center, retrospective chart review was to evaluate practices in management of alcohol withdrawal in TNCC and MICU between April 1, 2017 and August 30, 2018. Outcomes were compared in those receiving fixed-dose regimens (n = 85) and symptom-triggered regimens (n = 62) of benzodiazepines.

There were no major differences in baseline characteristics between the two groups, except for a significantly lower median initial Glasgow Coma Score (GCS) in the as needed group [14 (11-15) vs 15(14-15); p= 0.0162]. Patients in the fixed-dose group received more benzodiazepines (average 4.26 mg LE daily vs 1.88 mg LE daily) and had higher dexmedetomidine usage (67.1% vs 58.1%; p=0.264, median duration: 2 days (0-3) vs 1 day (0-3.25); p=0.0506]. They were more likely to be intubated while in the ICU (59.7% vs 40.7%), and more often developed delirium tremens (16.5% vs 6.5% p = 0.0672). While significantly more patients in the as needed group were intubated throughout the hospital stay (25.9% vs 43.5%; p=0.0248), they were more likely to be intubated prior to transfer into the ICU. The as needed group was also more likely to receive antipsychotic medications (32.3% vs 8.8%; p=0.413). There were no significant differences between ICU length of stay (p=0.1277) or incidence of seizures (p=0.3915) between the two groups.

This study demonstrated several inconsistencies among benzodiazepine prescribing habits and variation in nursing threshold for administration of as needed benzodiazepines. There is potential to improve patient outcomes through implementation of a standardized symptom-based assessment tool at our organization.

*LE = lorazepam equivalents

Evaluation of Prescribing Practices of Hyperosmolar Therapies in Adult Patients with Traumatic Brain Injury

By Christina Metrejean

The purpose of this study was to evaluate the prescribing practices of physicians at Our Lady of the Lake Regional Medical Center (OLOL) as they relate to hyperosmolar agents (hypertonic saline and mannitol) in traumatic brain injury (TBI) and determine if there were regimen-based effects on adult patients admitted to the Trauma-Neuro Critical Care (TNCC) and the Neurological Critical Care (NCCU) units.

The charts of one hundred eighty-four patient who received hyperosmolar therapy were reviewed with fifty patients meeting final inclusion criteria. Patients who received hyperosmolar therapies for neurological bleeds or hyponatremia, were diagnosed with rhabdomyolysis, were pregnant, or received dialysis were excluded from the study.

The administration of hyperosmolar agents was found to be associated with increased Glasgow

Coma Scale (GCS) scores. Hypertonic saline alone was associated with a significantly greater increase in GCS scores than combination therapy, while the increase in GCS between hypertonic saline and mannitol groups was similar. This mirrors the current guidelines and the understanding of the literature that concludes that hyperosmolar agents should be administered with no preference between hypertonic saline or mannitol.

Retrospective Evaluation of VEGF Inhibitor-Associated Hypertension at a Community Cancer Center

By Jasmin Eugene

Vascular endothelial growth factor (VEGF) inhibitors, which includes monoclonal antibodies and tyrosine kinase inhibitors, are used to treat different types of cancer. They work by inhibiting angiogenesis by binding to the VEGF ligand or receptor and slowing tumor growth. A major side of VEGF inhibitors is hypertension, which is caused by a decrease in nitric oxide production and an increase in vasoconstriction.

This was a retrospective, single-center chart review that assessed previously recorded blood pressure measurements of patients who took at least one dose of the following VEGF inhibitors: bevacizumab, ramucirumab, sorafenib, sunitinib, pazopanib, or regorafenib. The purpose of this project was to evaluate the practices of monitoring, identifying, and treating of patients with VEGF inhibitor-associated hypertension. An Epic™ crystal report was done for patients who received any of the listed VEGF inhibitors from March 2017 to August 2018. Patients had to receive VEGF inhibitors from multiple facilities. Patients were excluded from the study if they were less than 18 years of age, received a VEGF inhibitor outside of the study date, did not have an initial blood pressure in an EMR, received VEGF inhibitors for non-oncologic reasons, and/or were lost to follow-up defined as a patient who did not come to clinic within 6 weeks of initiation.

The primary outcomes of the study were to determine if VEGF inhibitor-associated hypertension was treated and the time it took for the first pharmacologic intervention for hypertension. The secondary outcomes were to assess the incidence of VEGF inhibitor-associated hypertension, the time to development or exacerbation of hypertension, the time to second pharmacologic intervention, and the achievement of blood pressure goal, which was < 140/90 mm Hg for patients who received a VEGF inhibitor prior to January 1, 2018 and < 130/80 mm Hg for patients who received a VEGF inhibitor after December 31, 2017.

One hundred and fifty-six patients were included in the study. Fifty-seven percent of patients were male with the average age of 61.8 (26-86) years. Sixty percent of patients were Caucasian and 53.8% were diagnosed with hypertension prior to VEGF inhibitor initiation. Fifty-seven percent of patients were diagnosed with colorectal cancer. Sixty-six percent of patients received Bevacizumab as their treatment. The average initial blood pressure was 130/70 mm Hg.

Ninety-three patients (59.6%) developed hypertension and 31 patients (33.3%) were treated for hypertension. The average time to first pharmacologic intervention was 57.8 (6-252) days.

The time to development or exacerbation of hypertension was 68.5 (6-252) days after the initiation of VEGF inhibitor. The time to second pharmacologic intervention was 132.3 (33-308) days after the initiation of VEGF inhibitors. Of the patients that were treated for VEGF inhibitor-associated hypertension, 11 patients (35.4%) achieved the blood pressure goal of < 140/90 mm Hg and 10 patients achieved the blood pressure goal of <130/80 mm Hg.

Currently, there are blood pressure parameters to inform physicians if a patient's blood pressure is elevated for bevacizumab and ramucirumab. However, there are no blood pressure parameters set for the other VEGF inhibitors either. In the future, Our Lady of the Lake can implement an Epic® alert for pharmacists verifying orders when blood pressure is elevated. There seems to be opportunity for educating the nursing staff as well.

Patient Safety Corner

ISMP Safety Practice Guidelines

Ensure fentanyl patches are not being prescribed for opioid-naive* patients or for patients with acute pain

*Opioid-tolerant patients are those who have received for 1 week or longer at least:

- Morphine 60 mg PO daily
- Fentanyl patch 25 mcg/hour
- Oxycodone 30 mg PO daily
- Hydromorphone 8 mg PO daily
- Oxymorphone 25 mg PO daily
- Hydrocodone 60 mg PO daily
- Or any equianalgesic dose of another opioid including heroin or non-prescribed opioids

Rationale

- The goal of this practice is to prevent death or serious harm from inappropriate use of fentanyl patches
- Fentanyl patches are ONLY for use in opioid-tolerant patients with persistent, moderate to severe chronic pain requiring continuous, around-the-clock opioid administration for an extended period of time that cannot be managed by other means

If you see something, say something

Remember to document any medication-related or other safety events you encounter in Quantros Safety & Feedback Reporting. It is important to also document using the hand-washing survey. Try to have at least 2 a month. Tracking these events provides data that helps us make changes to prevent future errors and keep our patients safe!

Preventing Burn Out

Some practical, stress-relieving strategies to prevent burnout and thereby helping minimize errors:

- Practice gratitude and seek fulfillment. Fill out Spirit Grams and write thank you notes to those for whom you are grateful. Find what makes you feel fulfilled at work and at home and incorporate those directly into your day.
- Be vigilant. Ensure workload is distributed appropriately (e.g. if a team member is out

Patient Safety Corner (Continued)

for the day, be sure tasks are redistributed so the work does not fall solely on one team member). **Be aware and willing to work as a team.**

- Create a supportive environment. This minimizes the opportunity for burnout to occur. Setting realistic expectations for yourself and others and appreciating a culture of support by being willing to ask for and receive help can keep away feelings of being depleted.
- Individualize when appropriate. What works for one team member may not work for another. Self-analysis is a critical step to determining what setting or communication method works best for an individual's personality and skills.
- Encourage work-life balance. Look deeper into this age-old mantra. Besides recognizing overload at work and home, recognize useful strategies such as noticing when you may be dismissing positive feedback instead of internalizing it. Accept opportunities for growth in your areas of interest or ask for help when necessary.

Staff Spotlight

John Shamma is a 2018 graduate of the University of Louisiana of Monroe College of Pharmacy and has been working at the Lake since after graduation. He chose the lake because it is a great place to work. He enjoys interacting with the pharmacy staff and he loves the community we serve. John chose pharmacy because he was really good at chemistry and biology. He feels that his skills is better suited for hospital pharmacy, because he can help with dispensing medication, assisting with treatment regimens, and answering any drug information questions.

John enjoys running and eating Lebanese and American food. John enjoys playing racquetball and disc-golf. He has a cat named Nahlia who is super fluffy and cute! His brother has an adorable dog named Cinnomon. One of John's favorite hobbies also includes napping. John says that if he was not a pharmacist, he would work at a plant like Exxon and follow in his mother's footsteps!

Recent FDA Approvals

Medication	Approved Indication
Mayzent (siponimod)	Relapsed forms of multiple sclerosis in adults
Balversa (erdafitinib)	Locally advanced or metastatic bladder cancer
Sunosi (solriamfetol)	Excessive sleepiness in adult patients with narcolepsy or obstructive sleep apnea
Zulresso (brexanolone)	Postpartum depression in adult women

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