

2021 Winner, 1<sup>st</sup> Place

**“A Multidisciplinary Approach to Reduce Opioid Use in Mechanically Ventilated Solid Cancer Patients”**

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**INTRODUCTION/HYPOTHESIS:**

Continuous infusion opioids used to facilitate mechanical ventilation can lead to over-sedation and poor outcomes. Multimodal pharmacotherapy decreases use of opioid and sedative agents but can be difficult to implement in an oncologic patient population with multiple considerations (e.g., bleed risk, antipyretic avoidance). This study aimed to reduce the use of intravenous continuous infusion opioids (CIO) in mechanically ventilated solid tumor patients in the medical intensive care unit (MICU) by 20% of morphine equivalents per day.

**METHODS:**

This quality improvement study was conducted at a tertiary oncology center with a multidisciplinary team of physicians, nurses, a respiratory therapist, an advance practice provider, and a clinical pharmacist. We performed process analysis to identify causes contributing to patient exposure to opioids and developed a multimodal analgesia-first algorithm in accordance to institutional and societal pain guidelines. A supplemental guidance document outlined strategies and common adverse effects for use of non-opioid analgesia, and recommendations for co-analgesics for neuropathic and chronic pain syndromes. Verbal and disseminated education were presented to members of each discipline prior to algorithm implementation and again at three months post implementation. Solid tumor patients admitted to the MICU and intubated for >48 hours were included in the study.

**RESULTS:**

A total of 111 patients were included; 37 from pre-algorithm (pR-a; October 2019 to February 2020), and 74 from post-algorithm (pO-a; Sept 2020 to April 2021) implementation. There was no difference in baseline hospital or ICU length of stay, or duration of intubation. No difference was seen in percent of time in severe pain (14% + 12 vs 13% + 11, p=0.561) or use of multimodal analgesia administration (32% vs 38%, p=0.366) in the pR-a and pO-a groups, respectively. Use of CIO decreased from 91.9% to 79.7% (p=0.082), the percent of oral morphine milligram equivalents derived from CIO decreased from 90% to 77% (p=0.064), and the usage of intermittent opioids increased from 21.6% to 36.5% (p = 0.083) in the pR-a and pO-a groups, respectively.

**CONCLUSIONS:**

A team-based multimodal approach to pain control in intubated solid tumor patients reduced exposure to continuous infusion of opioids while maintaining adequate pain control. Successful implementation was largely driven by algorithm creation by key stakeholders combined with continued education.

2021 Winner, 2<sup>nd</sup> Place

**“Liraglutide for insulin resistance after burn injury”**

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**Introduction:**

Hypermetabolism, manifested as hyperglycemia and insulin resistance, is common after severe burn injury. Oftentimes, patients require high doses of insulin to maintain blood glucose (BG) between 140 and 180 mg/dL. Adjunctive therapies typically used in patients with type 2 diabetes mellitus have not widely been studied in this patient population. Additionally, renal dysfunction or failure is commonly encountered after severe burn injury, which limits non-insulin options for insulin resistance. Liraglutide is an incretin mimetic and exerts its action by promoting glucose-dependent insulin secretion and decreasing glucagon secretion. We present a case where liraglutide was used for insulin resistance after severe burn injury.

**Description:**

A 58 year-old male was admitted after sustaining 34% TBSA burns (electrical and thermal). The patient did not have a history of type 2 diabetes mellitus and had a hemoglobin A1C of 5.6% on admission. Throughout his stay, the patient required high amounts of intravenous insulin, up to 1327 units/day (ICU Day 11) to maintain BG levels within goal. On ICU day six, sitagliptin was added to help improve BG control. Early in this patient’s hospital stay, he developed an acute kidney injury (AKI), requiring the initiation of continuous renal replacement therapy (CRRT) on ICU day 13. The patient did not show signs of renal recovery, was eventually transitioned to intermittent hemodialysis (IHD) (ICU day 96). On ICU day 92, the patient still required high amounts of insulin (160 units/day). Liraglutide 0.6mg subcutaneously daily was added on hospital and ICU day 93. Within one day, the patient was able to be transitioned off of an insulin infusion. On day two of liraglutide therapy, the patient required 23 units of insulin (19 from infusion and 4 units sliding scale insulin). On day three of liraglutide therapy, the patient required 14 units of sliding scale insulin. During this time, the patient’s dietary intake of carbohydrates did not significantly change.

**Discussion:**

Insulin resistance is common after severe burn injury. Non-insulin medications are not well-studied in this patient population. For patients with renal failure, non-insulin adjuncts are limited. Liraglutide may be an option to help liberate burn patients from insulin infusions and transition to lower levels of care. Further investigation is warranted.