

Understanding Intrathecal Duramorph

Complications: Duramorph Hypothermia

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Abstract

The adverse effects of duramorph hypothermia can cause immediate medical danger to the patient as well as increase their length of recovery. When there is a prolonged length of recovery there is also a delayed hospital discharge, further increasing medical costs. The average anesthesia provider may not have the knowledge base to develop a diagnosis, placing the patient at risk and delaying proper medical care as well. It is for this reason that providers need to have periodic continuing education in order to bring awareness and increase their knowledge when to potentially expect any risk of duramorph hypothermia, how to recognize the symptoms, how to diagnose, and, ultimately, how to treat it. Low dose lorazepam of 1mg IV push is the definitive treatment for this phenomena known as duramorph hypothermia.

Objectives

- Educate anesthesia providers by expanding their understanding of duramorph hypothermia, how to diagnosis, and how to treat
- The use of a clinical scenario was presented to demonstrate how to appropriately incorporate this presentation into practice
- Graduate presentation presented to both 1st & 2nd year SRNAs at ADU
- Increase provider understanding in order to bring light to an often misdiagnosed and mismanaged treatable adverse effect to a common anesthetic plan

Clinical Implications

- **Rule out differential diagnoses:**

Infection * Hypovolemia * Endocrinopathy * Environmental conditions * Iatrogenic causes & administered anesthetics

- **ALWAYS ASSESS** the patient **FIRST!**
- Note symptom onset, duration, & attempted treatments
- R/O any of the above possible causes of hypothermia
- Report to OB Anesthesiologist
- Suggest low dose lorazepam if appropriate
- **ALWAYS REASSESS** after any intervention!
- **ULTIMATELY** if you have exhausted all treatment modalities giving lorazepam will **NOT** harm the patient

What is Duramorph Hypothermia?

- Persistent **hypothermia** up to **6-24 hrs** after the administration of intrathecal duramorph in conjunction with paradoxical symptoms of hyperthermia, with the **sensation of feeling hot, diaphoresis, nausea, and NO shivering**
- Symptomatic hypothermia **non-responsive** to active warming measures
- Symptoms can present **regardless of the dose** of intrathecal duramorph
- Impaired central effects on thermoregulation
- **6-7%** occurrence with intrathecal duramorph injection
- Mechanism of action that causes this phenomenon is still not well understood
- Some have hypothesized opioids act centrally to decrease thermoregulatory set point in the **hypothalamus**, causing the body to perceive a normal temperature as a fever, spurring cutaneous vasodilation, sweating, and heat loss
- Effects are mediated via opioid receptors in CNS. Endogenous opioid system consisting of 3 G-protein-coupled receptors as mu, delta, and k-receptors with respective ligands b-endorphins, enkephalin, and dynorphins, which are vastly distributed throughout CNS and PNS
- Kappa receptors maybe the primary mechanism of opioid-induced hypothermia

Treatment

- Pre-treatment with diazepam was noted to be preventive
- Low dose **Lorazepam 0.5-1mg sublingual or IV Push** (SE: minimal sedation, increased risk of dizziness, drowsiness, and difficulty concentrating)
- Midazolam 1-2mg (due to shorter duration of action may require re-dosing)
- If the diagnosis & treatment for duramorph hypothermia is mistakenly treated the patient **WILL NOT** be harmed from this treatment regimen, but may experience some of the noted side effects above
- The use of Narcan is controversial

Literature Review

- **Clinical complications from hypothermia:**
Cardiovascular * Coagulation * Infection * Wound Healing * Increased Recovery Time * Increased Length of Stay
- **Hypothermia is defined as a ↓ in core temp of 1°C**
- **Specific coagulation problems:**
 - ◆ Platelet counts change w/ moderate to severe hypothermia
 - ◆ ↑ Coagulopathy ↑ Metabolic demands
 - ◆ ↓ wound healing
- **Normal effects from a neuraxial anesthetic:**
 - ◆ 1st a temperature drop of **1-2°C** from vasodilation caused from the sympathectomy with a duration of **60-90 minutes**
 - ◆ 2nd post regional impaired thermoregulation caudad from sympathetic block, **Disrupted thermoregulatory responses causing a false sense of warmth**
 - ◆ The bodies innate response to cause vasoconstriction or shiver is altered
- **Duramorph side effects: Respiratory Depression** * Sedation * **Nausea/Vomiting** * **Pruritus** * Urinary Retention * **Hypothermia** (used intrathecally)

Results

		Mean	N	Std. Deviation	Std. Error Mean
Pair 1	PreTest	5.8250	40	2.52056	.39853
	PostTest	13.5500	40	1.41331	.22346

t-test for paired samples

Results 1st table show mean PreTest Score = 5.825

PostTest mean Score = 13.550

Paired Samples Test										
		Paired Differences						t	df	Sig. (2-tailed)
		Mean	Std. Deviation	Std. Error Mean	95% Confidence Interval of the Difference					
					Lower	Upper				
Pair 1	PreTest - PostTest	-7.72500	2.48057	.39221	-8.51832	-6.93168	-19.696	39	.000	

2nd table confirmed significant increase of mean scores between PreTest & PostTest (p<000)

*References printed on the back