PI Name: Gary Peltz PI email: gpeltz@stanford.edu
Presentation preference: Oral

Ondansetron Reduces Neonatal Opioid Withdrawal Severity: A Randomized Clinical Trial

Gary Peltz[1], Meiyue Wang[1], Lauren M. Jansson[2], and Walter Kraft[3]

[1] Department of Anesthesiology, Pain and Perioperative Medicine, Stanford University School of Medicine, Stanford, CA; [2] Department of Pharmacology and Experimental Therapeutics, Thomas Jefferson University, Philadelphia, PA; [4] Department of Pediatrics, Johns Hopkins University School of Medicine, Baltimore, MD

Background: There is a critical need for non-opiate medications that can prevent the neonatal opioid withdrawal syndrome (NOWS). We investigated whether the 5-HT3 antagonist ondansetron, which reduced opioid withdrawal symptoms in a murine model and in opioid naïve human subjects, could reduce NOWS severity or incidence in at risk infants.

Methods: A randomized, double blind, multicenter clinical trial enrolled 90 infants with *in utero* exposure to opioids. Pregnant mothers received one dose of ondansetron (or placebo) during labor and neonates received a daily dose of ondansetron (or placebo) for five days. We examined the fraction of infants requiring morphine therapy, symptom scores and the duration of hospitalization.

Results: Twenty-two (49%) ondansetron-treated and 26 (63%) placebo-treated infants required morphine for NOWS ($p>0.05$). The symptom (Finnegan) score was significantly reduced in the ondansetron-treated vs placebo group (4.6 vs. 5.6, $p=0.02$). Moreover, the number of ondansetron-treated neonates with a short duration of hospitalization was increased and was decreased among those with longer ($\geq$16 days) hospital stays (vs. placebo). There were no safety issues associated with ondansetron treatment, nor did it cause QTc interval prolongation.

Conclusions: Ondansetron caused a statistically significant reduction in NOWS severity; and there was a strong trend toward a reduction in the length of hospital stay among ondansetron-treated subjects. Additional studies examining subjects with a more prolonged period of ondansetron treatment are warranted to confirm that this non-opiate medication reduces the incidence and severity of NOWS in at risk infants.