Objective: Upon completion of this presentation, the participants will be able to get a comprehensive view on the use of remifentanil for labor analgesia, and be able to incorporate it in their clinical practice safely.

Summary: An ideal intravenous opiate should be effective, simple to administer, have the profile that can match the unique time course of uterine contractions, and have minimal maternal and neonatal adverse effects. Among various systemic opioids that have been explored as alternatives to regional analgesia for labor, remifentanil has emerged, over the last decade, as the most suitable one.

Remifentanil has unique pharmacokinetic properties. It is a potent ultrashort acting μ opioid receptor agonist, which is metabolized to an inactive metabolite by non-specific esterases in the blood and other tissues. It exhibits rapid onset with peak effect at 1-3 min, and has a context sensitive half-time of 3 min. Its short duration of action and lack of accumulation following prolonged administration makes it more suitable for continuous infusion. Although it crosses the placenta freely, it is eliminated quickly in the neonates by rapid redistribution and metabolism.

Several investigators have evaluated the use of remifentanil in the form of patient controlled analgesia (PCA) with and without continuous background infusion in an effort to determine the ideal dosing regimen for labor analgesia. It was determined that the timing of bolus, the lockout interval and its rate of administration are crucial for providing successful analgesia with remifentanil. To match the intermittent pain pattern of uterine contractions, and to optimize the ideal pharmacokinetic profile of remifentanil, it seems appropriate to provide basal analgesia via a continuous infusion to which small additions of rescue analgesia could be provided during the peak of the contraction using PCA boluses. Also, rather than administering a fixed dose, its rate should be titrated to patient’s response due to inter-individual variability and progressive nature of labor pain. A background infusion ranging from 0.025-0.05 μg/kg/min, along with a PCA bolus 0.25 μg/kg, and a lockout interval of 2 minutes is advocated to be one of the safe regimes for labor analgesia.

Remifentanil has been shown to produce modest reductions in pain scores by about 40 mm with a high patient satisfaction rate. Maternal side effects such as desaturation, hypoventilation, nausea and vomiting are not uncommon when PCA bolus doses above 0.05 μg/kg and/or infusion rates above 0.5 μg/kg/min are used. However, these side effects are transient and easily reversible by stopping or decreasing the amount of drug administered. Remifentanil does not affect fetal heart rate, neonatal Apgar scores or umbilical cord gases. Close patient supervision, one-on-one nursing, and continuous oxygen saturation monitoring are warranted while using remifentanil.

Key Points:
1. Remifentanil has rapid onset and offset of action irrespective of the course of administration, and therefore offers flexibility in terms of the dose that may be administered as labor progresses.
2. PCA with remifenanil along with a low dose background infusion is an excellent alternative to regional analgesia; however, appropriate dosing regimen is vital for its success.
3. System should be in place to ensure one-on-one monitoring with trained caregivers.

Key References: