

# Obstetric Analgesia and Anesthesia

## Lecture 1

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## Topics to be covered

- History
- Factors associated with pain in labour
- Factors that effect transfer of drug to fetus
- Narcotics and fetus
- Maternal side effects on narcotics
- Neonatal side effects on narcotics

## History

- The first anesthetic used in obstetrics was chloroform and ether in 1848
- 1902- Morphine and Scopolamine were used to induce a twilight sleep.
- 1924 Barbiturates were added for sedation
- 1940 Dr. Lamaze and Read advocated “natural child birth”

## Factors associated with pain in Labor

- Anxiety (reduce fear and reduce pain)
- Rx of severe menstrual pain
- Age ( negative correlation)
- Socio-economic status (negative correlation)
- Education

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## Systemic Analgesics

- All narcotics used for pain relief in labor can have adverse effects on the mother and the fetus or neonate.
- Maternal adverse effects- cardiac, respiratory, allergic, GI, neurologic
- Fetal adverse - same

## Factors that effect the transfer of a drug to the fetus

- *Amount of drug*
- *Site of administration*
- *Drug distribution in maternal tissue*
- *Maternal metabolism*
- *Renal or liver excretion of the drugs and their metabolites*
- *Lipid solubility and protein binding*

## Factors that effect the transfer of a drug to the fetus

- Spatial configuration
- Molecule size
- Acid base status of the fetus (all narcotics are weak bases and will become concentrated in an acidotic fetus, or if the mother is alkalotic the narcotics will be concentrated in the fetus)

## Narcotics and the fetus

- Fetal metabolism is slower to metabolize narcotics because of the immature liver, also the blood brain barrier is very permeable so the fetuses are more susceptible to depression from narcotics.
- Narcotics can be given IV, IM. Continuous infusion



## Narcotics and the fetus

- IM injections result in a significant delay in analgesic effect
- IM injections can have unpredictable blood concentrations
- IM absorption is highly variable from patient to patient

## Narcotics and the fetus

- IV administration has advantages over IM injections. There is less variability in plasma levels, quicker onset of action and less medication is given per injection and it is easier to titrate dose.
- Observe patients for 15-20 min after IV narcotic injection

## Narcotics and the fetus

- IV dose can accumulate over time and cause respiratory depression
- Continuous IV infusion or PCA better pain control less placental transfer

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## Narcotics and labor

- Narcotics may decrease the progress of labor by reducing the force or rate of contractions ( this is dose dependant as well as dependant on the timing of the doses
- Biggest effect is in the latent phase
- In the active phase of labor narcotics may speed up the progress of labor by decreasing anxiety and decreasing catecholamines.
- Narcotics cause a decrease in long and short term variability
- Occasionally a sinusoidal pattern is observed after narcotic administration (severe anemia and hypoxia can cause this)

## Maternal side effects of Narcotic Analgesics

- Nausea and vomiting (increased smooth muscle tone, decreased peristalsis, pyloric sphincter spasm and delayed gastric emptying)
- Respiratory depression (decreased minute volume, lower oxygen saturation and a shift to the right of the co<sub>2</sub> curve causing hypoxia or hypercarbia, aspiration)

## Maternal side effects of narcotic analgesics

- Arterial and venous dilation because of histamine release and interference with baroreceptors
- Orthostatic hypotension can develop
- Usually cardiovascular effects are minimal unless the pt is hypovolemic or conduction anesthesia is used

## Neonatal side effects of narcotic analgesia

- Respiratory depression (decreased minute volume and oxygen saturation causing a shift of the CO<sub>2</sub> dissociation curve to the right)
- Neonates tolerate this much less than the mother so hypoxia and acidosis can occur rapidly

## Neonatal side effects of narcotic analgesics

- The maximal depressive effect from IM narcotics is 2-3 hours
- Certain narcotics such as Morphine or Alaphaprodine have 10 times the respiratory depressant actions when compare to meperidine.



## Neuro-behavioral effects of narcotics

- Apgar scores will reflect major depressant effects but there are specific tests to assess neural behavior of infants who were given narcotics in labor
- Evaluation consists of neonatal muscle tone, ability to alter their state of arousal, reflexes, and reactions to repetitive stimuli

## Neonatal effects of narcotic analgesics

- Some studies have shown behavior changes up to 4 days post delivery
- Suck less effectively
- Depressed visual and auditory attention
- Decrease reflexes
- Take longer to habituate to noise
- Decrease social responsiveness

## Management of Depressed neonate

- Narcan 0.2cc IM to the fetus (not the mother) (0.01-0.02mg/kg)
- Repeat in 3-5 minutes
- Narcan competitively displaces the narcotic molecule from its receptor
- Watch infant for 1 hour after narcan is given

## BIBLIOGRAPHY

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