

Positive Morphine Findings in Meconium after Postnatal Administration of Sevredol® (Morphine)? – A Case Report

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Background

Meconium is the **newborn's "first stool"**, containing water, epithelial cells, mucus, amniotic fluid and bile. The analysis of meconium is **generally used for detecting fetal drug exposure** providing evidence potentially relevant for child custody decisions.

Mechanisms of drug incorporation into meconium

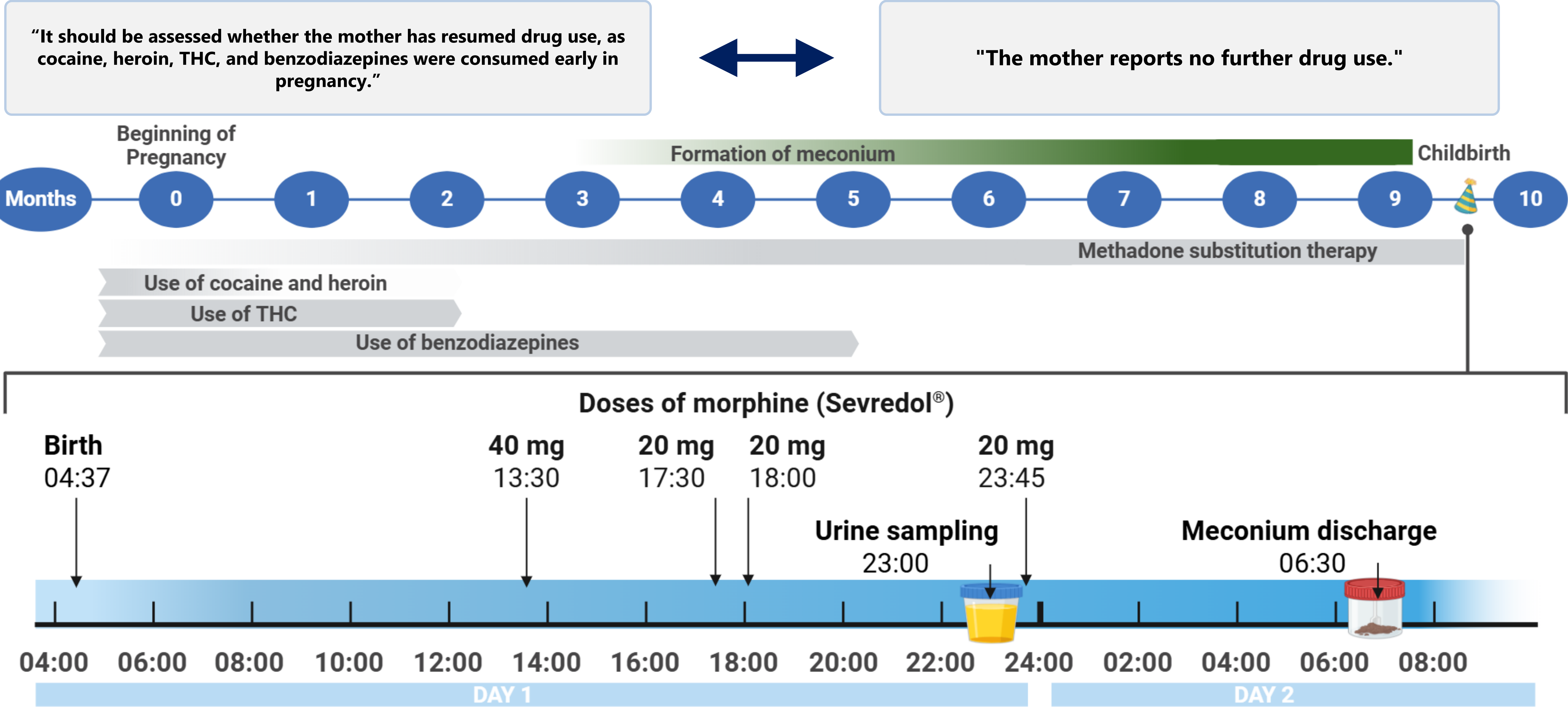
- Prenatal: 1) **transplacental transfer** into the fetal bloodstream, followed by **biliary excretion into the intestine**
2) **fetal swallowing of drug-containing amniotic fluid**, leading to accumulation of drugs and their metabolites in the fetal gut.
- Postnatal: Substance uptake occurs **directly (via the newborn)** or **indirectly (via maternal treatment)** during labor and delivery
→ Incorporation of drugs occurs likely within hours **suggesting rapid transfer and deposition**

Compared to other matrices (urine, newborn hair), meconium offers a **larger exposure window (extending over the third trimester)** and allows sampling directly from the diaper without disturbing the newborn. Passage of meconium generally occurs within **one to three days after birth**.



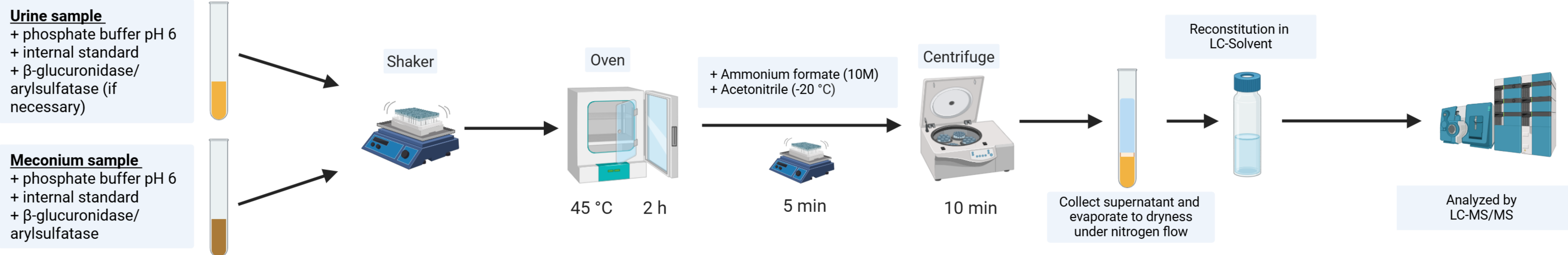
Timeline / Case history

Did the mother use heroin during later pregnancy?



Analytical Methods

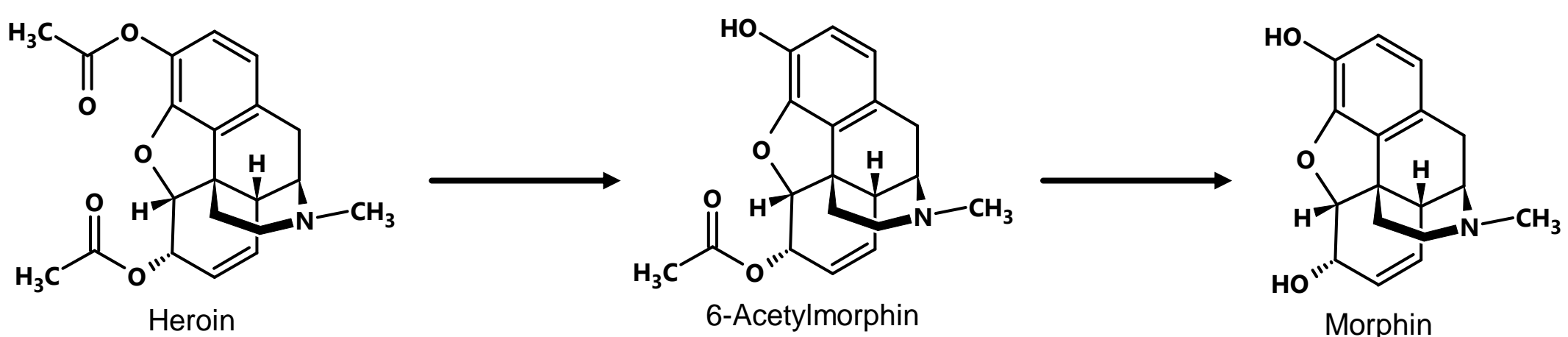
Meconium and urine samples were prepared using standard extraction methods (deglycuronidation/desulfation, protein precipitation). The samples were screened for common drugs of abuse including cocaine, opiates (morphine and codeine), amphetamines and a broad spectrum of medicinal drugs (Toxtyper). Positive results were confirmed and quantified by liquid chromatography-tandem mass spectrometry (LC-MS/MS).



Results & Discussion

Drugs of interest	Concentration in Meconium [ng/g]	Concentration in Urine [ng/ml]
Methadone	>3500	83
EDDP (metabolite of methadone)	>5000	250
Morphine	43	130
Normorphine	not detected	<1.0
Codeine	not detected	not detected
6-Acetylmorphine	not detected	not detected
Noscapine	not detected	not detected
Papaverine	not detected	not detected

- Methadone and EDDP in accordance with **substitution therapy**.
- No heroin-specific markers** (6-acetylmorphine, noscapine, papaverine, codeine) detected.
- Morphine finding in meconium could be explained by **urine contamination** or **postnatal stool formation**.
- Morphine in meconium and urine consistent with possible exposure due to **morphine accumulation in breast milk**.



References

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- Illustrations were created by BioRender

Conclusion

The results do not indicate renewed heroin use during the last trimester of pregnancy.

Careful evaluation of meconium analysis is essential, and the following information should be taken into account

- Maternal information on drug use during pregnancy
- Review of maternal medication (including during and after birth) and pharmacy history
- Consideration of specific markers and metabolic characteristics of drugs, and particular caution in cases where a substance may be both a parent drug and a metabolite of another drug

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