H63 An Unexpected Toxicological Finding in an Infant: A Case of Chronic Intrauterine Fluoxetine Exposure

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After attending this presentation, attendees will understand the importance of a full forensic investigation in apparent sudden infant deaths. Attendees will also be informed regarding fluoxetine and its metabolite, norfluoxetine, from toxicological results that implicate possible drug toxicity in an infant.

This presentation will impact the forensic science community by discussing a specific case that emphasizes the need for additional investigation in a case of infant death.

Fluoxetine is a commonly prescribed yet atypical antidepressant that has been available for depression management since 1987[1]. Fluoxetine increases the availability of serotonin within the Central Nervous System (CNS) by inhibiting its neuronal uptake. Fluoxetine is absorbed in the gastrointestinal tract and metabolized in the liver to its metabolite norfluoxetine.[2] Less than 10% of the parent drug, fluoxetine, is excreted unchanged in the urine.[1] Fluoxetine and norfluoxetine have long half-lives, with detectable concentrations found in plasma long after drug discontinuation.[3] Single-dose studies have reported plasma elimination half-lives of 1-3 days for fluoxetine and 7-15 days for norfluoxetine; however, following the discontinuation of long-term therapy, plasma elimination half-lives of fluoxetine and norfluoxetine averaged 8 days and 19 days, respectively.[1]

This presentation reports a case of a one-month-old female found unresponsive in a portable crib/playpen. Following further inquiry of the mother, it was discovered that the infant was sleeping with the mother on an adjacent couch prior to being placed into the portable crib/playpen the previous evening. It is believed that the infant was alive at the time of this placement. She was delivered via cesarean section one month before the mother's due date and had no known medical history.

A subsequent complete postmortem examination yielded no immediate cause of death. Bacterial culture of Cerebrospinal Fluid (CSF) was negative and genetic testing was also negative. Microscopic examination displayed hyperexpanded alveoli in the lungs, but nothing to explain the sudden death of the infant. Toxicology was negative for nearly all substances, but positive for norfluoxetine in postmortem heart blood, with a quantitative result of 55.2ng/mL.

Subsequent investigation revealed that the mother had been prescribed fluoxetine throughout pregnancy and postpartum. The mother denied ever having breastfed the infant and additional investigation generated no indication that the mother had been administering the drug to the infant. Following further review of the literature, it was discovered that concentrations of fluoxetine could be detectable for more than four weeks after the discontinuation of the drug in patients with prescribed long-term therapy.[3] Concentrations of its metabolite, norfluoxetine, could be detectable for more than eight weeks after the discontinuation of the parent drug.[3] Although this information aids in the understanding of residual drug concentrations after long-term administration followed by discontinuation, intrauterine exposure has not yet been fully studied or documented.

This unusual toxicological finding in an infant was deemed incidental, due to chronic intrauterine exposure to fluoxetine. The immediate cause of death and manner of death could not be determined.

Reference(s):

1. Baselt R. (2011). *Disposition of toxic drugs and chemicals in man, ninth edition*. Foster City, CA. Biomedical Publications.
2. Spencer Mary J. (1993). Fluoxetine hydrochloride (Prozac) toxicity in a neonate. *Pediatrics*. 92, 721.
3. Pato M. T., Murphy D. L., and DeVane C. L. (1991). Sustained plasma concentrations of fluoxetine and/or norfluoxetine four and eight weeks after fluoxetine discontinuation. *Journal of Clinical Psychopharmacology*. 11(3), 224-225.

Fluoxetine, Norfluoxetine, Intrauterine