

Department of Clinical Laboratory Sciences

Graduate Masters Theses

**A Comparison Of Drug Concentrations In Sequestered Femoral Blood With Thigh Muscle, Un-Sequestered Femoral Blood, Heart Blood, And Subclavian Blood Specimens To Evaluate The Degree Of Postmortem Drug Redistribution.**

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**ABSTRACT**

Postmortem drug concentrations may vary depending sampling site, volume of blood collected, method of sampling and the drugs' pharmacokinetic properties making it important to analyze specimens from different sites in the body to detect postmortem redistribution and avoid erroneous conclusions on cause of death. Using a blind stick method to draw blood from the femoral vessel may increase the likelihood of drawing blood from more central sites such as the heart, which may contain higher drug concentrations than peripheral blood. Therefore clamping the vessel before the blood is drawn may eliminate this possible contribution from other sites. Eight drugs from four different drug classes were evaluated to determine the extent of postmortem redistribution within five sampling sites. Sertraline, paroxetine, citalopram (Selective Serotonin Reuptake Inhibitor, SSRI), diazepam, alprazolam (benzodiazepines), diphenhydramine, promethazine (antihistamines) and hydrocodone (opiate) drug concentrations were evaluated in clamped femoral blood, blind stick femoral blood, subclavian blood, heart blood and muscle tissues. Clamped femoral blood and blind stick femoral blood ratios were compared using a two tailed t-test. There was no statistically significant difference between the two sites across all four drug classes. Comparison of blind stick femoral blood concentrations to subclavian, heart and muscle concentrations was done with linear regression. A correlation coefficient greater than or equal to 0.80 was considered significant. Subclavian blood concentrations were also found to have good correlation with blind stick femoral blood concentrations across all four drug classes. Heart blood concentrations did not have a significant correlation with blind stick femoral blood concentrations in the SSRI, antihistamine and benzodiazepine drug classes but had a significant correlation in the opiate drug class. Muscle concentrations did not have a significant correlation with blind stick femoral blood concentrations in the benzodiazepine and opiate drug classes but significantly correlated with the SSRI and antihistamine drug class. Clamping the femoral vessel did not appear to significantly affect drug concentrations and pharmacokinetic properties of drugs seemed to have an effect on drug concentration in different sites.