

Postmortem Urine Volume: How Hard-Pressed Medicolegal Examiner Labs Can Use a Simple Test to Help Screen for Alcohol/Drugs

Introduction

In an ideal world, all unexplained deaths would have a complete alcohol/drug screen conducted. With tight government budgets, however, this is not possible and medicolegal examiner toxicology laboratories have to make difficult choices. Now, new research has helped make those choices easier.

Postmortem Bladder Urine Volume as an Indicator of Alcohol/Drug Intoxication

It has been a frequent observation by forensic pathologists that postmortem urinary bladder distension has been associated with intoxication of the deceased. But there has been no published study confirming this observation until now. Rohner et al [1] determined the bladder urine volume physically in 259 autopsy cases by the pathologist and were compared to the non-invasive computed tomography (CT) result. Both the measured urine volume and CT estimated urine volume compared favorably with a mean difference of only 0.8 mL. The following table shows the mean measured urine volume in the deceased according to type of case (Table 1).

Case Type	Mean Urine Volume (mL)
Not intoxicated	92
Intoxicated	215
Alcohol Positive	217
Non Fatal Intoxication	161
Fatal Intoxication	255
Opiate. Methadone Positive	222
Cocaine Positive	321

The study determined that if a urinary bladder volume cutoff of 182 mL was employed that there was a 40% sensitivity and 87% specificity of detecting of detecting drug/alcohol intoxication. If a higher urine volume cutoff of 330 mL was used, there

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was a decrease in sensitivity or detecting alcohol/drug intoxication to 25% but the specificity increased to 97%.

The authors commented; "This means that the occurrence of urinary bladder distension as a single finding on post-mortem imaging should raise suspicion of intoxication and result in subsequent toxicological analyses".

Conclusion

This recent study has confirmed the old lore that postmortem urinary bladder distension is a sign of alcohol/drug intoxication of the deceased. Postmortem urine volume may provide a new preliminary screening test for the busy pathologist, coroner, medicolegal examiner or toxicologist. It also may detect cases in which there was no suspicion of alcohol/drug intoxication. Of course drug/alcohol screening choices should not be based on urine volume alone and more research should be conducted in this area.

References

- Rohner C, Franckenberg S, Schwendener N, Oestreich A, Kraemer T, et al. (2013) New evidence for old lore-urinary bladder distension on post-mortem computed tomography is related to intoxication. *Forensic Sci Int* 225(1-3): 48-52.