

Ancillary Tests in Forensic Pathology

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Objectivesw

- To learn what is done as a common practice in forensic pathology
- Normal findings on some tests

Typical Ancillary Tests

- Vitreous analysis
- DNA testing
- Microbiology
- Toxicology
- Diatom testing
- Other biochemical testing

Vitreous Analysis

- A sample of fluid collected from the eye
- Tests:
 - Na
 - K
 - Cl
 - Urea
 - Cr
 - Ketones
 - glucose

VA

- Glucose 0.5 mmol/L
- Urea 5.1 mmol/L
- Creatinine 42 umol/L
- Sodium 137 mmol/L
- Potassium 13.1 mmol/L
- Chloride 118 mmol/L
- Ketones Negative
- Interpretation: No significant abnormalities


VA

- Found dead in bed:
 - Glucose 34 mmol/L
 - Potassium 13 mmol/L
 - Sodium 116 mmol/L
 - Chloride 99 mmol/L
 - Ketones +4
 - Creatinine 21 umol/L
 - Urea 8 mmol/L

Diagnosis: Diabetic ketoacidosis.

Now we have added Bhydroxy butyrate to the test platform

VA

- Consider:
 - Na 102 mmol/L
 - K 20 mmol/L
 - Cl 69 mmol/L
 - Ketones negative
 - Cr 33 umol/L
 - UN 12 mmol/L
- Interpretation:
decomposition
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VA

- Na 156 mmol/L
- K 13.4 mmol/L
- Cl 142 mmol/L
- Cr 21 μ mol/L
- Urea 49 mmol/L
- Ketones Negative
- Interpretation: Dehydration pattern

DNA

- Mito DNA vs nuclear DNA
- Paternity testing
- Sexual activity kit
- Fingernail clippings and trace evidence

Microbiology

- Sudden death with evidence of infection
- Blood cultures, tissue culture, urine
 - Staph aureus
 - Invasive grp A strep
 - Occasional g neg
 - Important org. like meningioccus
 - Legionella in urine

Microbiology

- Challenges of interpretation: contamination, post mortem growth of organisms, previous antibiotic treatment, anaerobes

Virology

- NP swabs for respiratory pathogens
 - Influenza A and B
 - Parainfluenza 1, 2 and 3
 - Metapneumovirus
 - Adenovirus
 - CMV
 - Herpes
 - RSV
 - Enterovirus

Virology cont'd

- If we do blood for virology: normally the laboratory wants acute and convalescent sera to test: problem !
- We may ask for IgM for mumps, rubella, measles, parvovirus so please do not ask for convalescent samples
- HIV, Hep C and Hep B
- PEP for HIV

Virology

- Occasionally see other viruses like West Nile or encephalitis from various pathogens – typically suspected and verified with immunohistochemistry of tissue and occasionally in blood

Toxicology

- Alcohols= ethanol, isopropanol, methanol
- Ethylene glycol
- Drugs of abuse: stimulants (cocaine and meth, etc) and depressants (morphine, heroin, hydromorphone, hydrocodone, oxycodone etc)
- Drugs of therapeutic significance: base drugs (hundreds) but special attention with antidepressants, centrally active drugs, drugs used for epilepsy and methadone
- Benzodiazepines: immunoassays
- ASA and Acetaminophen
- THC

Designer Drugs

- Synthetic cannibinoids
- Hormones: anabolic steroids, insulin, GH
- Methamphetamine type stimulant drugs:
 - Adam, Eve, etc

Drownings

- Ethanol
- Drugs of abuse
- Benzos
- Diatom testing: no longer performed
- Strontium testing
- Magnesium
- Calcium

Environmental

- CO
- CN
- H₂S
- Natural gas
- Vitiated atmosphere

Questions