Urinalysis and Body Fluids

Unit 2; Session 5

Crystals Found in the Urine
Microscopic Examination – Part C, Common Alkaline Crystals

Normal Crystals in Alkaline Urine

- Alkaline urine pH ≥ 7.0, however, crystals don’t always follow the rules regarding pH
- Phosphates
  - Amorphous phosphates
  - Triple phosphates
  - Calcium phosphates
- Calcium Carbonate
- Ammonium biurate

Amorphous Phosphates

- May appear similar to amorphous urates
- Differentiate:
  - Heavy white precipitate after refrigeration
  - Alkaline pH
  - Soluble in acetic acid
**Triple Phosphate**

- Triphosphate crystals (can look like fern leaf when going into solution)
- Polarizes light
- Demonstrates birefringence
- Dissolves in
  - Acetic acid

**Calcium phosphate**

- Small, flat plates; rectangle or wedged shaped
- May be single, or rosettes
- No clinical significance
Calcium Carbonate

- **Ca Carbonate**
  - Small, colorless dumbbell, and spherical shapes
  - Appear similar to dumbbell shaped calcium oxalate
  - Gas produced with addition of acetic acid
  - No clinical significance

Ammonium Biurate

- Rarely seen in freshly voided urine
  - Abnormal only if found in freshly voided urine
  - Common in old specimens and with urea-splitting bacteria
  - Only urates in alkaline urine
  - Low power magnification

Ammonium Biurate

- Yellow-brown spherical bodies with long, irregular spicules
  - Termed “thorn apple” or “cocklebur”, “Medusa head”
  - Rare form has no spicules
  - Dissolves in
    - Acetic acid
    - NaOH
  - And when heated (60°C)
References

- Susan Strassinger & Marjorie Di Lorenzo, *Urinalysis and Body Fluids*, 5th Ed.
- Mary Haber, MD, *A Primer of Microscopic Urinalysis*, 3rd Ed.