

Ketones

Interpretive Summary

Description: Ketonuria is primarily an indicator of diabetic ketoacidosis.

Decreased Ketones

Common Causes

- Normal
- False negative
 - Aged urine sample
 - Improper storage of reagent strip (exposed to moisture, heat, or light)

Elevated Ketones

Common Causes

- Diabetic ketoacidosis
- Prolonged fasting or starvation

Uncommon Causes

- Low carbohydrate diet
- Strenuous exercise, e.g. endurance racing
- Exposure to severely cold environment
- Lactation (in dogs)
- Genetic diseases
 - Mitochondrial myopathy
 - Glycogen storage disease
- Persistent fever
- False positive
 - Highly pigmented urine
 - Urine containing
 - Phthalein dyes
 - Compounds with sulfhydryl groups (captopril, valproic acid, d-penicillamine, tiopronin, cystine)
 - Aspirin
 - Levodopa

Related Findings

- Diabetic ketoacidosis
 - Increased glucose, TCO₂, ALP, ALT, BUN, creatinine, cholesterol, anion gap
 - Decreased sodium, phosphorus, potassium (can also be normal or increased)
 - Increased fructosamine
 - Glucosuria and ketonuria, variable bacteruria and pyuria
 - Increased Spec fPL® or Spec cPL® if concurrent pancreatitis

Additional Information

Physiology

- Ketones, such as beta-hydroxybutyrate, acetoacetate, and acetone, are produced by lipolysis and are filtered by the glomeruli.
- Normally, ketones are completely resorbed by the proximal tubules.
- Ketonuria is present before ketonemia can be detected.
- The severity of ketoacidosis cannot be correlated with the degree of ketonuria.

Diagnostic Methodology

- Nitroprusside reaction
 - Detects acetoacetate (primarily) and acetone (to a lesser degree)
 - Does not detect beta hydroxybutyrate (the major intermediate in ketosis)

References

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Last updated 11/1/2013