Albumin

Interpretive Summary

Description: Albumin is an important regulator of osmotic equilibrium in the body and is also a carrier for highly protein-bound substances (e.g. calcium, thyroxine, fatty acids, and some drugs).

Decreased Albumin

Common Causes

- Decreased production
  - Liver disease
    - Atrophy
    - Fibrosis/cirrhosis
    - Portosystemic shunt
    - Neoplasia
  - Maldigestion
    - Exocrine pancreatic insufficiency (EPI)
  - Malabsorption
    - Small intestinal disease
  - Malnutrition
    - Cachexia
    - Dietary deficiency
    - Parasites
  - Inflammation (negative acute phase reactant)
  - Compensatory (with hyperglobulinemia)
- Increased loss
  - Hemorrhage (especially external)
    - Gastrointestinal [GI] tract
    - Urinary tract
    - Other
  - Protein-losing nephropathy (PLN)
    - Glomerulonephritis
    - Amyloidosis
  - Protein-losing enteropathy (PLE)
    - Lymphangiectasia
    - Inflammatory bowel disease [IBD]
    - Neoplasia
    - Fungal infection
    - Intestinal parasitism
  - Addison's disease
- Hemodilution
  - Excess administration of intravenous fluid

Uncommon Causes

- Decreased production
  - Neonates
  - Pregnancy, lactation
  - Maldigestion/malabsorption
    - Brush border enzyme deficiency
- Increased loss
  - Protein-losing dermatopathy

        - Burns
        - Severe exudative skin disease
        - Vasculitis
        - Trauma
    - High-protein effusions
        - Pancreatitis
        - Peritonitis
        - Vasculitis
- Hemodilution
    - Edema disorders
        - Congestive heart failure
        - Nephrotic syndrome
        - Hydrothorax
        - Ascites
    - Concurrent hypovolemia and increased total body water
        - Fluid accumulation in a third space
        - Fluid accumulation in the GI tract
    - Syndrome of inappropriate ADH secretion (SIADH)

Related findings

- Decreased production
    - Liver disease
        - Increased liver enzymes (ALT, AST, ALP, GGT), bile acids
        - Decreased BUN, cholesterol, glucose
        - Globulins usually normal. decreased A:G ratio
    - Maldigestion (EPI)
        - Decreased trypsin-like immunoreactivity (TLI)
    - Malabsorption (small intestinal disease)
        - Decreased cobalamin, increased or decreased folate
        - Decreased globulins and total protein as well as albumin
    - Malnutrition (cachexia, dietary, parasitic)
        - Positive fecal ova and parasites
- Increased loss
    - External hemorrhage
        - Decreased globulins and total protein as well as albumin
        - Regenerative anemia
    - Protein-losing nephropathy
        - Dilute urine
        - Increased urine protein:creatinine ratio
        - Increased BUN, creatinine, phosphorus with secondary tubular damage
        - Systemic hypertension
    - Protein-losing enteropathy
        - Decreased globulins and total protein as well as albumin
        - Decreased cobalamin, increased or decreased folate
        - Increased fecal alpha-1 protease inhibitor
        - Positive fecal ova and parasites
        - Abnormal histopathology on intestinal biopsy
    - Addison's disease
        - Lack of a stress leukogram
        - Sodium and chloride may be decreased; K may be increased
        - Adrenal function testing: low baseline cortisol, abnormal ACTH stimulation test

Increased Albumin

Common Causes

- Hemoconcentration (pre renal azotemia)

Uncommon Causes

- Absolute hyperalbuminemia is rare and of doubtful significance.
- Artifact: depending on testing methodology increases may be seen with:
    - Lipemia
    - Hemolysis
    - Icterus
    - Use of heparinized plasma (interference due to fibrinogen)

Related Findings

- Hemoconcentration
    - Increased total protein/globulins
    - Increased BUN and creatinine, possibly increased phosphorus
    - Electrolytes changes (usually increases)
        - Increased sodium, chloride, potassium due to dehydration
        - Increased calcium due to increased albumin (bound to albumin)
    - Increased hematocrit
    - Concentrated urine

Additional Information

Physiology

- In addition to being an important osmotic regulator and carrier for highly protein bound substances albumin is a negative acute phase reactant. This means that hypoalbuminemia often develops in acute inflammation and acute tissue injury.
- It is manufactured exclusively by the liver.

References

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Last updated 11/1/2013