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Medical Encyclopedia: Total protein

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Alternative names

TP

Definition

This is a test that measures the total amount of protein in serum (serum is the fluid portion of blood, without fibrinogen).

How the test is performed

Blood is drawn from a vein or a capillary. The laboratory centrifuges the blood to separate the serum from the cells. The total protein test is done on serum.

How to prepare for the test

Your health care provider may instruct you to withhold certain drugs that can affect the test.

Drugs that can increase total protein measurements include anabolic steroids, androgens, corticosteroids, dextran, growth hormone, insulin, phenazopyridine, and progesterone.

Drugs that can decrease total protein measurements include ammonium ions, estrogens, hepatotoxic drugs, and oral contraceptives.

Why the test is performed

Total protein is a rough measure of serum protein. Protein measurements can reflect nutritional state, kidney disease, liver disease, and many other conditions. If total protein is abnormal, further tests must be performed to identify which protein fraction, and then which specific protein, is abnormal.

Proteins are important constituents of all cells and tissues. Proteins are made from amino acids. There are many different kinds of proteins in the body with many different functions. Enzymes, some hormones, hemoglobin (oxygen transport), LDL (cholesterol transport), fibrinogen, (blood clotting), collagen (structure of bone and cartilage), immunoglobulins (antibodies) are some examples of proteins.

Serum proteins are separated into two groups: albumin and globulins. Total protein equals albumin plus globulin. Globulins are roughly divided into alpha-1, alpha-2, beta, and gamma globulins.

Albumin is the protein of highest concentration in the serum (plasma is serum plus fibrinogen). Albumin is a carrier of many small molecules, but is also of prime importance in maintaining the osmotic pressure of the blood (that is, keeping the fluid from leaking out into the tissues).

Normal Values

The normal range is 6.0 to 8.3 gm/dl (grams per deciliter).

Normal values may vary slightly from laboratory to laboratory.

What abnormal results mean

Greater-than-normal levels may indicate:

- Chronic inflammation or infection
- Multiple myeloma
- Waldenstrom's disease

Lower-than-normal levels may indicate:

- Burns (extensive)
- Glomerulonephritis
- Hemorrhage
- Liver disease
- Malabsorption (inadequate absorption of nutrients from the intestinal tract)
- Malnutrition
- Protein-losing enteropathy
- Agammaglobulinemia
- Light chain disease

Additional conditions under which the test may be performed:

- Congenital nephrotic syndrome

Special considerations

Total protein measurement may be increased during pregnancy.

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