

Lect.6.

Proteins

Definition:

Hundreds of Proteins are dissolved in the plasma , by measuring the concentration of these Proteins, the clinician can obtain information regarding disease states in different organ system , the measurement of Protein is done on serum , which is the fluid that remains after plasma has clotted removing fibrinogen .

The normal Protein level is 6-8 g\dl. Albumin makes up 3.5to 5.0 g\dl.

Technique of Protein:

Protein :the most widely used method of measuring serum Protein is the biuret reaction. the principle of this reaction is that serum Proteins react with copper sulfate in sodium hydroxide to form a violet(biuret test).

Albumin

Definition:

Albumins actually comprise a family of proteins that share a similar globe-like structure and are found in animals. The albumin found in human blood, human serum albumin, is the primary focus of this article.

Albumin is the most abundant protein in human blood, accounting for 50 to 60% of all the protein in the blood. It's made by the liver, circulates throughout the body in blood, and a very small amount may pass through healthy kidneys into urine.

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Technique of Albumin

Is generally measured by a dye-binding technique that the ability of albumin to form stable complex with bromocresol green dye .

The BCG -albumin complex.

The total globulin :is a fraction is generally determined by subtracting the albumin from total proteins .

Albumin:

Albumin levels in the body can be affected by a number of health conditions such as having a history of liver disease, since albumin is made in the liver.

It can also be low in persons with a history of certain kidney diseases that cause protein to be lost in urine.

Albumin levels can also drop quickly if infection develops .

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The problems with High-protein Diet

The Institute of Medicine recommends that 10 to 35 percent of daily calories come from protein. Most Americans do not get close to the 35 percent mark; they eat about 12 to 18 percent of their calories as protein, according to the NIH.

The efficacy and safety of high-protein diets is still being studied. Often, they lead to a quick drop in weight-loss but their overall sustainability is unclear. One 2011 review of high-protein diet studies found that “although half of the studies showed a higher weight loss with a high-protein diet, three out of four studies with the longest intervention show no statistical difference in weight loss, high-protein diets can carry some health risks.

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TOTAL Protein (BIURET)

Principle

Cupric ions in an alkaline solution react with the peptide bonds of proteins and polypeptides containing at least two peptide bonds to produce a violet colored complex.

The absorbance of the complex at 546 nm is directly proportional to the concentration of protein in the sample.



PROCEDURE

Preparation and stability of working reagent The reagents are ready for use, If the absorbance of working reagent is higher than 0.1 at 546 nm the reagent cannot be used.

Assay conditions

Wavelength: 546 nm (530-580) nm

Temperature: 37 °C

Cuvette: 1 cm light path

Read against: reagent blank

(Method: endpoint (increasing))

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	Blank	Standard	Sample
Standard	-	10ml	-
Sample	-	-	10ml
Work reagent	1ml	1ml	1ml

Calculation using calibration:

(Mg\dl)=O.D sample\ O.D standard X standard concentration

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Result of T.Protein

Liver Function Test

Test	Result	Reference Range
S. GOT (A.S.T)		up to 40 U/L
S. GPT (A.L.T)		up to 49 U/L
S. Total Bilirubin		0.3 – 1.2 mg/dl
S. Direct Bilirubin		0.1 – 1.0 mg/dl
S. Indirect Bilirubin		<0.7 mg/dl
S. albumin		33 – 55 g/L
S. Total protein	6.01	6.4-8.3 g/dl

Liver Function Test

Test	Result	Reference Range
S. GOT (A.S.T)		up to 40 U/L
S. GPT (A.L.T)		up to 49 U/L
S. Total Bilirubin		0.3 – 1.2 mg/dl
S. Direct Bilirubin		0.1 – 1.0 mg/dl
S. Indirect Bilirubin		<0.7 mg/dl
S. albumin		33 – 55 g/L
S. Total protein	7.23	6.4-8.3 g/dl

Liver Function Test

Test	Result	Reference Range
S. GOT (A.S.T)		up to 40 U/L
S. GPT (A.L.T)		up to 49 U/L
S. Total Bilirubin		0.3 – 1.2 mg/dl
S. Direct Bilirubin		0.1 – 1.0 mg/dl
S. Indirect Bilirubin		<0.7 mg/dl
S. albumin		33 – 55 g/L
S. Total protein	8.92	6.4-8.3 g/dl

Liver Function Test

Test	Result	Reference Range
S. GOT (A.S.T)		up to 40 U/L
S. GPT (A.L.T)		up to 49 U/L
S. Total Bilirubin		0.3 – 1.2 mg/dl
S. Direct Bilirubin		0.1 – 1.0 mg/dl
S. Indirect Bilirubin		<0.7 mg/dl
S. albumin		33 – 55 g/L
S. Total protein	5.33	6.4-8.3 g/dl

Liver Function Test

Test	Result	Reference Range
S. GOT (A.S.T)		up to 40 U/L
S. GPT (A.L.T)		up to 49 U/L
S. Total Bilirubin		0.3 – 1.2 mg/dl
S. Direct Bilirubin		0.1 – 1.0 mg/dl
S. Indirect Bilirubin		<0.7 mg/dl
S. albumin		33 – 55 g/L
S. Total protein	5.32	6.4-8.3 g/dl

Liver Function Test

Test	Result	Reference Range
S. GOT (A.S.T)		up to 40 U/L
S. GPT (A.L.T)		up to 49 U/L
S. Total Bilirubin		0.3 – 1.2 mg/dl
S. Direct Bilirubin		0.1 – 1.0 mg/dl
S. Indirect Bilirubin		<0.7 mg/dl
S. albumin		33 – 55 g/L
S. Total protein	9.37	6.4-8.3 g/dl

Liver Function Test

Test	Result	Reference Range
S. GOT (A.S.T)		up to 40 U/L
S. GPT (A.L.T)		up to 49 U/L
S. Total Bilirubin		0.3 – 1.2 mg/dl
S. Direct Bilirubin		0.1 – 1.0 mg/dl
S. Indirect Bilirubin		<0.7 mg/dl
S. albumin		33 – 55 g/L
S. Total protein	6.4	6.4-8.3 g/dl