Hellabio

# ...means electrophoresis

## PATHOLOGICAL INCREASE AND DECREASE OF SERUM PROTEINS

| Electroph. zone - interzone | Pre-Alb | | Alb | a1 | | | | | α2 | | β1-β2 | | | | | γ | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Prealbumin (TTR) | (Albumin + drugs) | Albumin | α1-lipoproteins | α1-antichymotrypsin | (orosomucoid) | α1-antitrypsin | Ceruloplasmin | α2-macroglobulin | Haptoglobins | Transferrin | (C3c) | β-lipoproteins | Hemopexin | C3 | Fibrinogen | γ-globulins | M-proteins | CRP | Muramidase |
| Caused by: | | | | | | | | | | | | | | | | | | | | |
| Acute phase reaction | ↓ | | ↓ | | ↑ | ↑ | ↑ | ↑ | ↑ | ↑ | ↓ | | | | ↑ | ↑ | | | ↑ | |
| Amyloidosis | ↑ | | | | | | | | | | | | | | | | | M | | |
| Age >70 years | | | ↓ | | | | | | ↓ | | | | | | | | ↓ | | ↑ | |
| <12 years | | | ↓ | | | | | | | | | | | | | | | | | |
| Allergic diseases | ↓ | | ↓ | | | | | ↑ | ↑ | | | | | | | | ↑ | | | |
| Anemia | | | | | | | | | | | ↑ | | | | | | | | | |
| Alcoholics | ↑ | | ↓ | ↑ | | | | | | | | | | | | | | | | |
| Aspirin intake | | ↑ | | | | | | | | | | | | | | | | | | |
| α1- antitrypsin deficiency | | | | | | | ↓ | | | | | | | | | | | | | |
| Bilirubin-hyperbilirubinemia | | ↑ | | ↓ | | | | | | ↓ | | | | | | | ↑ | | | |
| B12-vit.and folic acid deficiency | | | | | | | | | | | | | | | | | | | | |
| Biliary: | | | | | | | | | | | | | | | | | | | | |
| a)Obstruction | | | | ↓ | | | | | ↑ | ↑ | ↑ | | ↑ | | ↑ | | ↑ | | | |
| b)Cholestasis of pregnancy | | | ↓ | | | | | | ↑ | | ↓ | | | | | | ↑ | | | |
| Cardiac insuficiency | | | ↓ | | ↑ | | | | ↑ | ↑ | ↓ | | | | | | | | | |
| a)myocardial infraction | | | | | ↑ | ↑ | ↑ | ↑ | ↑ | ↑ | | | | | | | | | ↑ | |
| b)cardiac failure | | | ↓ | | | ↑ | ↑ | ↑ | ↑ | ↑ | | | | | | | | | ↑ | |
| Colitis ulcerative | | | ↓ | | | | ↑ | | ↑ | | ↓ | | ↓ | ↓ | | | ↑ | | ↑ | |
| Cushing disease | | | ↓ | | ↑ | | | | | | ↑ | | | | | | ↑ | | ↑ | |
| Corticosteroids | | | | | | ↑ | | | | | | | | | | | | | ↓ | |
| Carcinomatosis(Malignancy) | | | ↓ | | | | ↑ | | ↑ | | ↑ | | | | | | ↑ | M | | |
| a)Multiple myeloma | | | | | | | | | | | | | | | | | ↑ | | | |
| b)Malig. or retic cell prolifer. | | | | | | | | | | | | | | | | | ↓ | | | |
| c)Waldenstrom disease | | | ↓ | | | | | | | | | | | | | | ↑ | M | | |
| Cystic fibrosis | | ↓ | | ↓ | | | | | | | | | ↓ | | | | | | | |
| Diabetes melitus | | | ↓ | ↑ | | | | | | ↑ | | | ↑ | | | | ↓ | | ↑ | |
| Drugs | | ↑ | | | | | | | | | | | | | | | | | | |
| Embryonic tumor | | | | | | | | | | | | | | | | | | | | |
| Estrogens intake (pills) | | | ↓ | ↑ | | ↓ | ↑ | ↑ | ↑ | | ↑ | | ↑ | | | | | | | |
| Hypergammaglobulinemia | | | ↓ | | | | | | | | | | | | | | ↑ | | | |
| Hodgkins disease | | | ↓ | | | | | | ↑ | ↑ | | | | | | | ↑ | | | |
| Hemolysis ( hemol. anemia) | | | | | | | | | | ↑ | | | | | ↓ | | | | | |
| Inflammation : a)acute | ↓ | | ↓ | ↑ | ↑ | ↑ | ↑ | ↑ | ↑ | ↑ | ↓ | | | | ↑ | ↑ | ↓ | | ↑ | |
| b)subacute | | | ↓ | | ↑ | ↑ | ↑ | ↑ | ↑ | | | | | | | | ↑ | | | |
| c)chronic | | | ↓ | | | | ↑ | | | ↑ | | | | | ↑ | ↑ | ↑ | | | |
| d)chronic active | ↓ | | ↓ | ↓ | ↑ | ↑ | ↑ | ↑ | ↑ | | ↓ | | | | | | | | ↑ | |

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| Leukemia (myeloblastic) | | | ↓ | | | | | | | | | | | | | ↑ | | | ↑ |
| Lupus Erythematosus (systemic) | | | ↓ | | | | | | | ↑ | | | | | ↓ | | ↑ | | |
| Liver: a)Cirrhosis acute | ↓ | | ↓ | ↓ | | | ↑ | | ↓ | ↓ | | | | | | | | ↑ | |
| b)Cirhosis chronic | | | ↓ | | | | ↑ | ↑ | ↓ | ↓ | ↑ | | | | ↓ | | ↑ | ↑ | |
| c)Hepatitis acute | | | ↓ | ↓ | | | ↑ | | ↓ | | ↑ | | | | | | ↓ | ↑ | |
| d)Hepatitis chronic | | | ↓ | | | | ↓ | | ↑ | ↑ | | | | | | | ↑ | | |
| e)Viral hepatitis | | | ↓ | | | | ↑ | | ↓ | | | | ↑ | ↑ | | | ↑ | ↑ | |
| f)Jaundice | | | ↓ | | | | ↑ | | ↑ | ↑ | ↓ | | | | | | ↑ | ↑ | |
| g)Hepatosplenomegaly | | | ↓ | | | | ↑ | | | | ↓ | | | | | | | ↑ | |
| h)Injury | | | ↓ | ↓ | ↑ | ↑ | ↑ | | | ↓ | ↓ | | | | | | | ↑ | |
| i)tumor | | | ↓ | | | | | | | | ↓ | | | | | | ↑ | | |
| Lymphatic vessel aplasia | | | ↓ | | | | | | | | | | | | | | ↓ | | |
| Macroglobulinemia | | | ↓ | | | | | | | | | | ↑ | ↑ | | | ↑ | | |
| Malnutrition | ↓ | | ↓ | | | | ↓ | ↓ | ↓ | | ↑ | | | | | | | | |
| Myelosclerosis | | | ↓ | | | | | ↑ | | | | | | | | ↑ | ↑ | | ↑ |
| Mucosal disease | | | ↓ | | | | | | | | | | | | | | ↓ | | |
| Myeloma | | | ↓ | | | | | | | | ↑ | | ↑ | | | | ↑ | | |
| Proteinuria: a)glomerular | | | ↓ | | | | | | ↑ | ↑ | ↑ | | | | ↓ | | | | |
| b)tubular | | | ↓ | | | | | | ↑ | | | | ↑ | ↑ | | | ↑ | | |
| c)assoc. with dysglobulinemia | | | | | | | ↑ | | | | | | | | | | ↑ | | |
| Pregnancy (contraseptive pills) | ↓ | | ↓ | ↑ | | ↓ | | ↑ | ↑ | | ↑ | | | | | | | | |
| Rheumatoid arthritis | | | ↓ | | | | | | ↓ | | | | | | ↓ | | ↑ | | |
| Renal disease: a)insufficiency | | | ↓ | | | ↑ | | | ↑ | ↑ | | | | | | | | | |
| b)glomerulonephritis | | | ↓ | | | ↑ | | | ↑ | | ↓ | | | | | | | | ↑ |
| c)acute nephritis | | | ↓ | | | | | | ↑ | ↑ | | | | | ↓ | ↑ | | | ↑ |
| d)membranoproliferative glomerulonephritis | | | ↓ | | | | | | ↑ | ↑ | ↓ | | | | ↑ | ↑ | ↑ | | |
| e)sel. glom. protein loss | | | | | | | ↓ | | ↑ | | | | | | | | | | |
| f)Nephrotic syndrome | | | ↓ | | | | | ↓ | ↑ | | ↓ | | | | | | ↓ | | |
| Puberty | | | | ↓ | | | | | | ↓ | | | | | | | | | |
| Sepsis | | ↓ | ↓ | | | | ↑ | | | ↑ | | | | | | ↑ | | | ↑ |
| Trauma | | | ↓ | | ↑ | ↑ | ↑ | ↑ | ↑ | ↑ | ↓ | ↑ | | | ↑ | ↑ | | | ↑ |
| Thrombolysis | | | | | | ↑ | | ↑ | ↑ | | | | | | | | | | ↑ |
| Triglyceride (interm.metabolism) | | | | | | | | | | | | | | | | | | | |
| Toxicosis (autotoxicosis) | | | ↓ | | | | ↑ | | | ↑ | | ↑ | | | | | ↑ | | |
| Uremia , shock | | | ↓ | | ↑ | ↑ | | ↑ | ↑ | | | | | | | | | | ↑ |
| Thyroid : a)hyperthyroidism | | | | | | | | | ↑ | | | | | | | | ↑ | | |
| b)hypothyroidism | | | | | | | | | ↑ | | ↑ | | | | | | ↑ | | |
| Wiskott Aldrich syndrome | | | ↓ | | | | | | | | | | | | | | ↓ | | |

***Disclaimer***: The above arrows are indicative and not absolute. Cases of patients are likely to show different electrophoretic patterns and therefore the above table should not be used as a diagnostic standard. Some of the above indications are considered controversial.