Volume 3, Issue 2, February 2025 ISSN (E): 2938-3765

BASIC BIOCHEMICAL PARAMETERS

Daminov F. A.
DSc, Ass. Professor, Head of the Department of Clinical
Laboratory Diagnosis with the Course of Clinical Laboratory Diagnostics of PGD

Karimova M. M.
Assistant of the Department of Patophysiology;

Nuraliyeva N.Z.
Cadet of the Department of Clinical Laboratory Diagnosis with the
Course of Clinical Laboratory Diagnostics of PGD;
Samarkand State Medical University Samarkand, Uzbekistan

Abstract
Comprehensive laboratory examination, including all major blood biochemical parameters and allowing to assess the function of the liver (ALT, AST, total bilirubin), kidneys (urea, creatinine), as well as the metabolism of carbohydrates (glucose), lipids (total cholesterol) and proteins (total protein) [3,4].

Keywords: Metabolism, lipids, proteins, laboratory examination, biochemical parameters.

Introduction

How to prepare for the examination:

-Do not eat for 12 hours before the examination, you can drink clear non-carbonated water.
-Exclude physical and emotional stress for 30 minutes before the examination.
-Do not smoke for 30 minutes before the examination. Общая информация об research

Basic biochemical indicators of blood allow a comprehensive assessment of the functions of various organs and systems. Together with a general blood test (GBC) and a general urinalysis (GUM), this complex examination is part of the 'clinical minimum' of tests, which is performed at almost any visit to a doctor. The test is a screening test and includes basic indicators that can be used to assess the basic functions of the human body and to suspect the most common diseases [1,2,3].

To assess liver function, the liver enzymes alanine aminotransferase (ALT) and aspartate aminotransferase (AST) and total bilirubin are examined.

ALT and AST are enzymes that catalyse the transfer of amino groups between amino acids (transaminases). Although these enzymes can also be found in many other tissues and organs (heart, skeletal muscle, kidney, brain, red blood cells), changes in their concentration in the blood are more often associated with liver disease, hence their name - hepatic transaminases. ALT is a more specific marker of liver disease than AST. In viral hepatitis and toxic liver damage, there is usually the same increase in ALT and AST levels. In alcoholic hepatitis, liver metastases and

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cirrhosis, there is a more pronounced increase in AST than in ALT. It should be noted that there is no direct correlation between the degree of liver damage and the level of hepatic transaminases [4,5,6,7].

Bilirubin is a pigment formed during the breakdown of haemoglobin and some other haem-containing proteins in the liver, spleen and bone marrow. Total bilirubin is a combination of unbound (indirect, albumin-associated) and glucuronic acid-associated (direct) bilirubin. Increased bilirubin levels can be seen in many liver diseases, but the greatest value of this marker is in the differential diagnosis of jaundice and the diagnosis of biliary tract obstruction. When the level of total bilirubin is elevated, it is advisable to examine direct bilirubin and calculate the value of indirect bilirubin, as well as to examine the concentrations of such markers of biliary tract obstruction as alkaline phosphatase (ALP) and gamma-glutamyl transpeptidase (GGTP) [8,9,10,11].

Serum creatinine and urea are examined to assess renal function

Creatinine is the end product of the metabolism of creatine phosphate, an energy substrate formed in muscle. Creatinine is freely filtered in the renal tubules and is used as an indicator of glomerular filtration rate (GFR) and overall renal function. Elevated serum creatinine levels are indicative of decreased CRP and impaired renal function, but can also be seen in dehydration and muscle tissue damageIt should be noted that changes in creatinine levels are not an early sign of kidney disease: an increase in creatinine levels above the upper limit of normal is observed when the CRP is already 50% lower. This is especially important in elderly patients, in whom the progressive decline in CRP is not accompanied by a deviation of creatinine levels from the norm due to a decrease in its production in the body of an elderly person. For this reason, serum creatinine is not recommended as the sole indicator of renal function assessment. The optimal indicator for assessing renal function is the CKF, which can be obtained either by calculation using serum creatinine concentration (as well as sex, age, race, and body size) or by the Rheberg test [13,14,15,16].

Urea is the end product of protein metabolism, formed in the liver and excreted by the kidneys. It is traditionally used in conjunction with creatinine to assess renal function, but may also indicate liver disease [17,18,19].

Glucose is an integral indicator of carbohydrate metabolism and one of the criteria for diagnosing diabetes mellitus (DM). Regular fasting blood glucose measurement will help to diagnose diabetes in time and prevent its complications [20,21].

Total cholesterol is an integral indicator of lipid metabolism and one of the criteria for diagnosing atherogenic dyslipidaemia [22,23].

Regular measurement of cholesterol levels will allow timely diagnosis of lipid metabolism disorders and prevent cardiovascular diseases such as myocardial infarction. Currently, measurement of total cholesterol levels is recommended to start at the age of 35 years for men and 45 years for women, or earlier in the presence of several risk factors for cardiovascular diseases (e.g. family history of hypercholesterolaemia, presence of a relative with early CHD). It should be noted that the most accurate information about lipid metabolism will be obtained by performing a

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lipidogram, including, in addition to total cholesterol, other parameters, including the main fractions of blood lipoproteins [24,25].

Total protein is an integral indicator of protein metabolism. Of greater importance is the decrease in total protein, which can be observed in nutritional deficiencies (anorexia, starvation), the presence of chronic infectious (tuberculosis), inflammatory (rheumatoid arthritis) and oncological diseases, as well as disorders of liver function (liver cirrhosis), kidney function (nephrotic syndrome) and intestinal absorptive function (protein-losing enteropathies) [22,23]. This comprehensive analysis includes basic biochemical parameters and allows you to suspect underlying diseases. Additional laboratory tests may be required for more accurate health information [4,5,6].

It should be noted that the deviation of any indicator from the norm does not always indicate the presence of a disease, and the result of the analysis should be interpreted in conjunction with all available data about the patient.

The most accurate information about the patient's state of health will be obtained when assessing the baseline indicators in dynamics, i.e. when comparing repeated analyses. Repeated analyses are recommended to be performed with the same test systems, i.e. in the same laboratory [8,9,10,11,12,13].

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