BLOOD BIOCHEMICAL ANALYSIS: ASSESSING THE CHEMICAL STATE OF THE BODY

Yakubova D. M.

Assistant of the Department of Clinical Laboratory Diagnostics,

Narzullaeva M. A.

Assistant of the Department of Pharmaceutical Organization,

Oqmurodova B. U.

Cadet of the Department of Clinical Laboratory Diagnostics,

Samarkand State Medical University

Abstract:

Blood biochemical analysis is one of the primary laboratory tests widely used in medicine, aimed at determining the levels of various substances, enzymes, ions, hormones, and metabolites in the human body. Through this analysis, doctors assess the overall health of the patient, the state of metabolism, as well as the functioning of the liver, kidneys, heart, endocrine system, and other organs. Blood biochemical analysis plays an important role in diagnostics, treatment planning, and preventive examinations.

Keywords: glucose, protein, bilirubin.

Why is blood biochemical analysis necessary?

1. Disease Detection:

   - Identifying diseases of the liver, kidneys, heart, gastrointestinal tract, endocrine system, and other organs.

   - Diagnosing metabolic disorders (e.g., diabetes, hypothyroidism) and hemolytic diseases.

2. Monitoring Treatment:

   - Monitoring the patient's condition during treatment and adjusting therapy as needed.

E CONF SERIES

International Conference on Scientific Research in Natural and Social Sciences
Hosted online from New York, USA
Website: econfseries.com   2nd April, 2025

3. Prevention:
   - Early detection of diseases through regular health check-ups.
4. Assessing Metabolism:
   - Evaluating metabolic status by measuring the levels of glucose, cholesterol, proteins, electrolytes, and other substances in the blood.

Key indicators in blood biochemical analysis:
1. Glucose:
   - Normal: 3.3–5.5 mmol/L (in fasting blood).
   - Importance: Identifying diabetes, insulin issues, and metabolic syndrome.
2. Creatinine:
   - Normal: 44–106 µmol/L (men), 44–97 µmol/L (women).
   - Importance: Assessing kidney function.
3. Urea (nitrogen):
   - Normal: 2.5–8.3 mmol/L.
   - Importance: Evaluating kidney performance and protein metabolism.
4. Liver enzymes:
   - ALT (Alanine aminotransferase): indicates liver cell damage.
   - AST (Aspartate aminotransferase): identifies liver and heart diseases.
   - ALP (Alkaline phosphatase): detects liver, bone, and bile duct diseases.
5. Bilirubin:
   - Normal: total bilirubin -5-20 µmol/L.
   - Importance: Assessing liver function and hemolysis.
6. Cholesterol and Lipids:
   - Total cholesterol: 3.0- 6.0 mmol/L.
   - Triglycerides: 0.5- 2.0 mmol/L.
   - Importance: Identifying cardiovascular diseases.
7. Electrolytes:
   - Sodium (Na): 135-145 mmol/L.
   - Potassium (K): 3.5- 5.5 mmol/L.
   - Calcium (Ca): 2.15-2.50 mmol/L.
   - Magnesium (Mg): 0.65-1.05 mmol/L.

   - Importance: Assessing fluid-electrolyte balance and heart function.

8. Proteins:

   - Total protein: 60- 85 g/L.

   - Albumin: 35- 50 g/L.

   - Importance: Evaluating protein metabolism and immune system function.

9. Amylase and Lipase:

   - Amylase: 28- 100 U/L.

   - Lipase: 0- 190 U/L.

   - Importance: Assessing pancreatic function.

10. LDH (lactate dehydrogenase):

   - Normal: 120- 240 U/L.

   - Importance: identifying tissue damage.

11. Creatine kinase (CK):

   - Normal: 24-195 U/L (men), 24–170 U/L (women).

   - Importance: Identifying heart and muscle diseases.

   How is Blood Biochemical Analysis Conducted?

1. Preparation:

   - The analysis is usually performed on an empty stomach (8-12 hours after the last meal).

   - Some tests (e.g., glucose) may be taken after meals.

   - Certain medications may need to be temporarily discontinued based on the physician's instructions.

2. Procedure:

   - Blood is typically drawn from a vein (often from the elbow).

   - Various substances in the blood sample are measured in the laboratory.

   Interpreting Results

   Biochemical analysis results may vary based on the patient's age, gender, weight, health status, and other factors. Therefore, results should only be interpreted by a physician (therapist, endocrinologist, gastroenterologist, etc.). For example, an increase in creatinine levels may indicate kidney failure, while an increase in glucose may suggest diabetes.

   Importance of blood biochemical analysis:

E CONF SERIES

International Conference on Scientific Research in Natural and Social Sciences
Hosted online from New York, USA
Website: econfseries.com 2nd April, 2025

- Detectability: Allows for early detection of many diseases.
- Wide Applicability: Assesses the functioning of the liver, kidneys, heart, endocrine system, and other organs.
- Treatment Planning: Based on analysis results, the physician can develop an individualized treatment plan for the patient.

Blood biochemical analysis is one of the most important diagnostic methods in medicine, enabling the assessment of the patient's overall health, early detection of diseases, and effective treatment planning. It is crucial to consult a specialist (physician) for proper interpretation of the analysis results and to make informed decisions based on them. Regular health check-ups and timely preventive measures are recommended to maintain your health.

References:
1. Qalandar M., Azizxonovna N. M. MINERAL SUVLARNING SHIFOBAXSH XUSUSIYATLARI //O'ZBEKISTONDA FANLARARO INNOVATSIYALAR VA ILMIY TADQIQOTLAR JURNALI. – 2025. – T. 4. – №. 37. – C. 317-322.
2. Mamadalievna K. Y., Azizxonovna N. M. ZAMONAVIY TIBBIYOTDA FLAVANOIDLARNING O'RNI //O'ZBEKISTONDA FANLARARO INNOVATSIYALAR VA ILMIY TADQIQOTLAR JURNALI. – 2025. – T. 4. – №. 37. – C. 75-81.
3. Umida D., Bobur S., Azizkhanovna N. M. THE ROLE OF MINERAL WATERS IN MODERN MEDICINE //AMERICAN JOURNAL OF MULTIDISCIPLINARY BULLETIN. – 2025. – T. 3. – №. 2. – C. 139-145.
4. Azizkhanovna N. M. et al. INTERACTIVE TEACHING METHODS IN MODERN MEDICINE //AMERICAN JOURNAL OF APPLIED MEDICAL SCIENCE. – 2025. – T. 3. – №. 1. – C. 361-366.
5. Azizkhonovna N. M. et al. PROSPECTIVE PLANS FOR RABBIT BREEDING //AMERICAN JOURNAL OF APPLIED MEDICAL SCIENCE. – 2025. – T. 3. – №. 1. – C. 354-360.
6. Azizkhanovna N. M. et al. INTERESTING ANALYZES ABOUT RABBITS //AMERICAN JOURNAL OF APPLIED MEDICAL SCIENCE. – 2025. – T. 3. – №. 1. – C. 367-372.

International Conference on Scientific Research in Natural and Social Sciences
Hosted online from New York, USA
Website: econfseries.com   2nd April, 2025

7. Azizxonovna N. M., Nafisa D., Dilso'z O. TYPES AND SIGNIFICANCE OF INNOVATIVE TECHNOLOGIES IN MODERN MEDICINE //AMERICAN JOURNAL OF APPLIED MEDICAL SCIENCE. – 2025. – Т. 3. – №. 1. – С. 137-142.

8. Нарзуллаева М. А. ФЛАВОНОИДЫ ГЛАЗАМИ ФАРМАКОЛОГА. ОСОБЕННОСТИ И ПРОБЛЕМЫ ФАРМАКОКИНЕТИКИ //O'ZBEKISTONDA FANLARARO INNOVATSIYALAR VA ILMIY TADQIQOTLAR JURNALI. – 2024. – Т. 3. – №. 33. – С. 49-60.