**Elaborated by Feghiu Iuliana**

**Patient’s Chief Complaints**

Provided by wife: “My husband’s very confused and he has been acting strangely. This morning, he couldn’t answer my questions and seemed not to recognize me.”

**The patient S.** is a 46 years male with a history of chronic alcoholism. He was admitted to the hospital from the outpatient clinic with abdominal swelling and confusion. He has unintentionally gained 8 lbs during the past four weeks. Before becoming confusing the patient complains of abdominal pain, itching, nausea, vomiting, hematemesis, gum bleeding, loss of appetite, weakness, diarrhea.

**Medical history**

• Cirrhosis diagnosed 4 years ago with ultrasound and liver biopsy (micronodular cirrhosis)

• uncontrolled ascites

• two episodes of upper GI hemorrhages from esophageal varices (2 years ago)

• E. coli-induced bacterial peritonitis 3 years ago

• No history to suggest cardiac or gallbladder disease

• No previous diagnosis of viral or autoimmune hepatitis

**On physical examination**: The patient is restless, mildly jaundiced, and disoriented to time, place, and people.

• BP 110/65, Ps- 83, regular (supine)

• BP 95/60, Ps- 106, regular (standing); ECG – Sinus tachycardia. Low amplitude of T wave, U wave.

• Breathing rate - 27/min

**Skin.** Dry, warm with reduced turgor, hyperkeratosis, scratching. Jaundice. Palmar erythema. Ecchymoses on lower extremities. Ginecomastia.

**Abdomen** is moderately distended, firm, and slightly tender. Prominent veins observed around umbilicus.

**Diuresis** is reduced. Urine is dark.

**Feces** fade, presence of lipids.

**Laboratory Blood Test Results**

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| **CBC** | **VALUES** | **REFERENCE RANGES** |
| **Hematocrit** | 36 | **Males** 39 - 49%  **Females** 35 - 45% |
| **Hemoglobin** | 11,8 | **Males** 13,6 - 17,5 g/dL  **Females** 12,0 - 15,5 g/dL |
| **Red blood cells (RBC)** | 3,7 | 4,7-6,1 million/cu mm |
| **MCV** | 71 | 80 -100 fL |
| **MCH** | 19 | 26 – 34 pg |
| **MCHC** | 25 | 31 - 36 g/dL |
| **White blood cells** | 3.5 | 4,800–9,000/cu mm |
| **Basophil count** | 0,5 | 0 - 1,0 |
| **Eosinophil count** | 3 | 1. 4% |
| **Lymphocyte count** | 26 | 25 - 35% |
| **Monocyte count** | 5 | 3 - 7% |
| **Thrombocytes** | 86,000 | 150,000 – 450,000/cu mm |

**BIOCHEMICAL BLOOD TESTS**

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| --- | --- | --- |
| **Protein total** | 4,1 | 6,0 – 8,0 g/dL |
| **Albumin** | 2,2 | 3,4 – 4,7 g/dL |
| **Globulin** | 5,7 | 2.6 - 4.6g/dL |
| **Fibrinogen** | 98 | 160 – 450 mg/dL |
| **Prothrombin time** | 20,2 | 11,0 -13,5 sec |
| **Glucose, *serum fasting*** | 46 | 60 – 110 mg/dL |
| **Glucose, *2 hours postprandial*** | 197 | < 150 mg/dL |
| **Triglyceride** | 145 | <165 mg/dL |
| **Cholesterol** | 109 | Desirable: < 200 mg/dL  Borderline: 200–239 mg/dL  High risk: >240 mg/dL |
| **Blood urea nitrogen (BUN)** | 5,8 | 8 – 20 mg/dL |
| **Creatinine** | 0,4 | 0,6-1,2 mg/dL |
| **Bilirubin total** | 3,8 | 0,1 – 1,2 mg/dL |
| **Direct or conjugated bilirubin** | 2,4 | 0,1 - 0,5 mg/dL |
| **Indirect or unconjugated bilirubin** | 1,4 | 0,1 – 0,7 mg/dL |
| **Alanine aminotransferase (ALT)** | 209 | 7-56 IU/L |
| **Aspartate aminotransferase (AST)** | 107 | 0 – 35 IU/Ll |
| **Ammonia (NH3)** | 250 | 18 – 60 µg/dL |
| **Lactic acid** | 2,8 | < 2,0 mmol/L |
| **Ketone bodies** | 2,2 | < 1mg/dl |
| **Ca++** | 1,7 | 2,1 - 2,6 mmol/L |
| **Na+** | 156 | 135 - 145 mEq/L |
| **K+** | 3,3 | 3,5 – 5,5 mEq/L |
| **Folic acid** | 103 | 165 - 760 ng/mL |
| **B12 vitamin** | 98 | 140 - 820 pg/mL |
| **Vitamin A** | 21 | 30 – 65 mg/dL |
| **Vitamin E** | 0,3 | 0,5 – 0,7 mg/dL |
| **Vitamin D, 1,25OH** | 16 | 20 -76 pg/mL |

**Arterial Blood Gases**

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| --- | --- | --- |
| **Parameter** | **Value** | **Reference ranges** |
| **pH** | 7,32 | 7,35 - 7,45 |
| **PaO2** | 78 | 98 mmHg |
| **PaCO2** | 32 | 35 - 40 mmHg |
| **SaO2** | 85 | >95% |

|  |  |  |
| --- | --- | --- |
| **Bicarbonate** | 30 | 21 – 28 mEq/L |

1. What is etiology of this disease? Pathogenetic mechanism?
2. Explain the pathophysiology of liver fibrosis?
3. What are the pathogenetic mechanisms of ascites in the patient?
4. What is the pathogenetic mechanism of hepatic encephalopathy?
5. Which laboratory test strongly suggests that the patient has developed hepatic encephalopathy?
6. What is glycemic dyshomeostasis in the patient? Pathogenetic mechanism.
7. What are the changes in protein profile in the blood? Mechanisms?
8. What are the changes in lipid profile in the blood? Mechanisms? Consequences
9. Explain the hemodynamic changes in the patient?
10. Explain the respiratory changes in the patient?
11. Explain the cutaneous changes in the patient?
12. What biochemical tests shows impairment of liver function? What are liver-specific tests?
13. Explain the hematological changes in the patient. Pathogenetic mechanisms?
14. What is the pathogeny of anemic syndrome in this patient?
15. What types of anemia can develop in patients with chronic liver failure? Pathogenetic mechanisms.
16. What are the hydro-electrolytic disturbances in the patient? Mechanisms?
17. What are the acid-base disorders in the patient? Mechanisms.
18. Explain the changes of diuresis?