**Clinical case 1**

Patient, M, 54 years old was admitted with complaints of abdominal pain, diarrhea for 4 days, dizziness, muscle weakness. On objective examination dry skin, reduced cutaneous turgor, dry mucosa of the oral cavity, dental impressions on the sides of the tongue. Diuresis for 24 hours approximately 500 ml. Blood pressure reduced - 75/ 45 mmHg, FCC - 118/min.

**Blood biochemical analysis:** serum sodium - 143 mEq/L (N: 135 - 145 mEq/L), serum potassium - 4.9 mEq/L (N: 3.5 - 5.5 mEqL), serum osmolarity 305 mOsm/L.

**Questions:**

**1.** **What water dyshomeostasis is present in this patient and what is the pathogenetic mechanism?**

**2.** **How is the extracellular water compartment affected in this water dyshomeostasis?**

**3.** **How is the intracellular water compartment affected in this water dyshomeostasis?**

**4.** **How is the intravascular water compartment affected in this water dyshomeostasis?** **What clinical manifestations are reflective of this change?**

**5.** **What changes in the general blood analysis (erythrocytes, hemoglobin, hematocrit) are expected to be present in this hydric dyshomeostasis?**

**6.** **What compensatory reactions are triggered in this hydrate dyshomeostasis?**

**7.** **What are the pathogenetic mechanisms that explain the reduction in diuresis in this patient?**

**Clinical case 2**

The patient, M, 64 years old was hospitalized with complaints of headache, tinnitus, muscle weakness, heart palpitations.

**On objective examination** icteric and dry skin, reduced cutaneous turgor, dry mucosa of the oral cavity, dental impressions on the sides of the tongue. Diuresis for 24 hours approximately 3500 ml. Blood pressure reduced - 60/ 40 mmHg, FCC - 128/min.

**Blood electrolytes:** Serum sodium - 123 mEq/L (N: 135 - 145 mEq/L), serum potassium - 6.4 mEq/L (N: 3.5 - 5.5 mEqL), Serum osmolarity 265 mOsm/L.

**From the anamnesis**, the patient is known to have ovarian tumor, and at the last examination, about 10 months ago, multiple metastases in the adrenal cortex were detected.

**Questions:**

**1.** **What water dyshomeostasis is present in this patient and what is the pathogenetic mechanism?**

**2.** **How is the extracellular hydric compartment affected in this hydric dyshomeostasis?**

**3.** **How is the intracellular water compartment affected in this water dyshomeostasis?**

**4.** **How is the intravascular water compartment affected in this water dyshomeostasis?** **What clinical manifestations are reflective of this change?**

**5.** **What changes in the general blood analysis (erythrocytes, hemoglobin, hematocrit) are expected to be present in this hydric dyshomeostasis?**

**6.** **How can the presence of hyperkalemia in this water dyshomeostasis be explained?**

**7.** **What sodium dyshomeostasis is present in this patient and explain the pathogenetic mechanism?**

**8.** **What compensatory reactions are triggered in this hydrate dyshomeostasis?**

**Clinical case 3**

Patient P, 72 years old was hospitalized in an unconscious state. According to his son he was found at home by neighbours. He is presumed to have been in this unconscious state for approximately 72 hours.

**On objective examination** dry skin, reduced cutaneous turgor, dry mucosa of the oral cavity, dental impressions on the sides of the tongue. Blood pressure low - 60/40 mmHg, C.B.C. 125/min. Respiration rate 36/min.

**Blood Electrolytes:** Serum Sodium - 163 mEq/L (N: 135 - 145 mEq/L), Serum Potassium - 4.4 mEq/L (N: 3.5 - 5.5 mEqL), Serum Osmolarity 365 mOsm/L.

**Questions:**

**1.** **What water dyshomeostasis is present in this patient and what is the pathogenetic mechanism?**

**2.** **How is the extracellular water compartment affected in this water dyshomeostasis?**

**3.** **How is the intracellular water compartment affected in this water dyshomeostasis?**

**4.** **How is the intravascular water compartment affected in this water dyshomeostasis?** **What clinical manifestations are reflective of this change?**

**5.** **What changes in the general blood analysis (erythrocytes, hemoglobin, hematocrit) are expected to be present in this hydric dyshomeostasis?**

**6.** **What sodium dyshomeostasis is present in this patient and explain the pathogenetic mechanism?**

**7.** **What compensatory reactions are triggered in this hydrate dyshomeostasis?**

**Clinical case 4**

The patient, D, 54 years old was admitted with complaints of headache, generalized peripheral edema. On objective examination edema in both legs and on the sides of the abdomen. Diuresis for 24 hours about 800 ml. Blood pressure - 180/115 mmHg, CBC - 67/min.

**Blood electrolytes:** Serum sodium - 158 mEq/L (N: 135 - 145 mEq/L), serum potassium - 3.2 mEq/L (N: 3.5 - 5.5 mEqL), serum osmolarity 365 mOsm/L, pH = 7.3 (N: 7.35 - 7.45)

From the history, the patient is known to have active secreting tumor in the glomerular area of the left adrenal gland.

**Questions:**

1. **What water dyshomeostasis is present in this patient and what is the pathogenetic mechanism?**

2. **How is the extracellular hydric compartment affected in this hydric dyshomeostasis?**

3. **How is the intracellular water compartment affected in this water dyshomeostasis?**

4. **How is the intravascular water compartment affected in this water dyshomeostasis?** **What clinical manifestations are reflective of this change?**

5. **What changes in the general blood analysis (erythrocytes, hemoglobin, hematocrit) are expected to be present in this hydric dyshomeostasis?**

6. **How can the presence of hypokalemia in this hydric dyshomeostasis be explained?**

7. **What sodium dyshomeostasis is present in this patient and explain the pathogenetic mechanism?**

8. **What are the pathophysiologic mechanisms of edema associated with this hydric dyshomeostasis?**

9. **What compensatory reactions are triggered in this hydric dyshomeostasis?**

**Clinical case 5**

The patient, G, 64 years old, was admitted with complaints of headache, generalized peripheral edema, muscle weakness, heart palpitations.

**On objective examination** jaundiced skin, edema on both legs and sides of the abdomen. Diuresis for 24 hours about 500 ml. Blood pressure - 175/110 mmHg, CBC - 68/min.

**Blood electrolytes:** Serum sodium - 128 mEq/L (N: 135 - 145 mEq/L), serum potassium - 5.9 mEq/L (N: 3.5 - 5.5 mEqL), serum osmolarity 265 mOsm/L.

From history, the patient is known to have ADH-secreting bronchial carcinoma.

**Questions:**

1. **What water dyshomeostasis is present in this patient and what is the pathogenetic mechanism?**

2. **How is the extracellular hydric compartment affected in this hydric dyshomeostasis?**

3. **How is the intracellular water compartment affected in this water dyshomeostasis?**

4. **How is the intravascular water compartment affected in this water dyshomeostasis?** **What clinical manifestations are reflective of this change?**

5. **What changes in the general blood analysis (erythrocytes, hemoglobin, hematocrit) are expected to be present in this hydric dyshomeostasis?**

6. **How can the presence of hyperkalemia in this hydric dyshomeostasis be explained?**

7. **What sodium dyshomeostasis is present in this patient and explain the pathogenetic mechanism?**

8. **What are the pathophysiologic mechanisms of edema associated with this hydric dyshomeostasis?**

9. **What compensatory reactions are triggered in this hydric dyshomeostasis?**