Acid-Base Disorders

Leseprobe

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Introduction

People cannot live without body fluid. Water is the largest single constituent of the body. In the average adult the total body fluid amounts to about 60% of the body weight. A loss of 10% of the body fluid is serious in an adult. For example, when a person vomits, he loses some of the normal fluid content of the body. If the vomiting continues and he does not drink fluids, the loss may become serious. The person becomes lethargic, the mucous membranes become dry, and body temperature increases. He becomes very uncomfortable when the body's fluid content is less than normal.

A loss of 20% of the fluid content is fatal. For example, a person with third-degree burns over a major area of the body will lose fluid through seepage from the burned areas. If the fluid is not replaced, he will die. By
We may use the term **extracellular** to refer to all the fluid outside the cells. The prefix **extra** - means outside of. In school we participate in extracurricular activities. Extracurricular activities are those pursuits that are not a part of the student's course of study but are important for learning. Extracellular means outside the cell.

The extracellular fluid is outside the cell, but part of that fluid is within the blood vessels.

Since **intra** - means within and - **vascular** means vessel the fluid that is within blood vessels is called intravascular.

Although some of the extracellular fluid is within the blood vessels (intravascular), the rest of the extracellular fluid is **between** the cells. Since this fluid is between the cells and blood vessels, it is called **interstitial** fluid.

Therefore the extracellular fluid is divided into two parts:

a. (within blood vessels) intravascular.

b. (between cells) interstitial.

If we divide all body fluid into only two groups, we use the cell as our point of reference; so fluids are either inside the cell or outside the cell.

The fluid compartments are separated by semipermeable membranes since the fluids outside the cells (intravascular and interstitial) are constantly mixing through the capillary walls. The extracellular fluid is contained within a communicating chamber.
If either extreme (swelling or shriveling of the cells) occurs in a person, death will result. Fluids and electrolytes must be kept in balance for health. When they remain out of balance, death occurs. If a strong salt solution is injected into the extracellular fluid, water will be pulled out of the cells to go where the salt is.

If the body loses more electrolytes than fluid, such as can happen in diarrhea, then the extracellular fluid will contain less electrolytes, or less solute, than the intracellular fluid.

Therefore the fluid will be pulled from the cells.

The osmotic pressure of a solution is proportional to the number of particles per unit volume of solvent. The unit of measure of osmotic pressure is the osmol. Therefore, the ability of solutes to cause osmosis and osmotic pressure is measured in terms of osmols. In the body, the osmol is too large a unit for satisfactory use in expressing osmotic activity. The term milliosmol (mosm), which equals 1/1000 osmol, is used to measure osmotic pressure in the body.

Another term we will use is osmolality. Osmolality means the number of osmotically active particles per kilogram of water.

The osmotic pull of all particles per kilogram of water is called osmolality.

Osmolality refers to the number of osmotically active particles per kilogram of water. A closely related term is osmolality. Osmolarity refers to the number of osmols per liter of solution.

The osmotic pull of all particles per liter of solution is called osmolarity.
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