

CASE BASE LEARNING

CASE -1

SHIFTING OF FLUID AND ELECTROLYTE ACROSS CELL MEMBRANE

Learning Objectives:

- Define Osmosis and how hypernatremia disturb the osmolarity and cellular function
- Enumerate the Factors affecting the movement of water and electrolytes across cell membrane (Between extracellular and intracellular compartment)
- Enumerate the causes of [Hypervolemic Hypernatremia](#) , [Isovolemic Hypernatremia](#) and [Hypovolemic Hypernatremia](#)
- How homeostasis is achieved if water and electrolytes are disturbed

Chief Complaint: 58-year-old man with upper abdominal pain and breathing problems

History: A 58-year-old Mohammad Javed resident of Saddar, Karachi known case of heart diseases was admitted in hospital for severe abdominal pain and vomiting He was not allowed to have food or drink by mouth (N.P.O or nil per oral). He received fluid through an intravenous (IV) line. Misreading the physician's orders, the doctor on duty hooked up a fresh bag of IV fluid that was "3%-normal" saline rather than the prescribed "half-normal" saline this mistake was not noticed until the following morning when he complained that it was difficult to breathe. At that time, he had marked swelling (pitting edema) around the sacral region and had inspiratory rales ("wet-sounding crackles") at the bases of the lungs on each side. as well. Blood was drawn, revealing the following:

Na⁺ 157 mEq / liter (Normal = 136-145 mEq / liter)
K⁺ 4.7 mEq / liter (Normal = 3.5-5.0 mEq / liter)
Cl⁻ 101 mEq / liter (Normal = 96-106 mEq / liter)