

SUBJECT: PHARMACEUTICS
TOPIC: ELECTROLYTE
REPLACEMENT THERAPY

NAME OF TEACHER: Zerah Sonu

Academic year: 2019

Replacement Therapy

- The basic objective of replacement therapy is to restore the volume and composition of the body fluids to normal one.
- Volume contraction is a life threatening condition because it impairs the circulation, blood volume decreases, cardiac output falls and the integrity of microcirculation is compromised.

- In volume depletion of sufficient magnitude to threaten life, a prompt infusion of isotonic sodium chloride solution is indicated.
- In an extreme case, intravenous therapy at the rate of 100 ml per minute for the first 1000ml has been considered necessary for the successful treatment of cholera.

Sodium Replacement

Sodium Chloride: NaCl (MW 58.44)

- It contains no added substances.
- it occurs as colourless cubic crystals or as white crystalline powder having saline taste.
- It is freely soluble in water, and slightly more soluble in boiling water, soluble in glycerine and slightly soluble in alcohol.

- Use: Used as fluid and electrolyte replenisher, manufacture of isotonic solution, flavour enhancer.
- Isotonic solutions are used in wet dressings, for irrigating body cavities or tissues
- Hypotonic solutions are administered for maintenance therapy when patients are unable to take fluids and nutrients orally for one to three days.
- Hypertonic solution/injection are used when there is loss of sodium in excess.

Official preparations of Sodium chloride

Sodium Chloride Injection

- a sterile isotonic solution of sodium chloride in water for injection.
- It contains not less than 0.85 % and not more than 0.95 % w/v of sodium chloride.
- It contains no antimicrobial agents.
- It is a clear, colourless solution with pH between 4.5-7.0.



Sodium Chloride Hypertonic Injection

(Hypertonic saline)

- It is a sterile solution of sodium chloride in water for injection.
- It contains not less than 1.52 % and not more than 1.68 % w/v of sodium chloride.
- It contains no antimicrobial agents. It is a clear, colourless solution with pH between 5.0-7.5.

- **Compound Sodium Chloride Injection
(Ringer injection)**

1. not less than 0.82 % and not more than 0.9 % w/v of sodium chloride.

2. not less than 0.0285 %, not more than 0.0315 % w/v of potassium chloride.

3. not less than 0.03 % and not more than 0.036% w/v of calcium chloride in water for injection.

It contains no antimicrobial agents. It is a clear, colourless solution with pH between 5-7.5.

Sodium Chloride and Dextrose Injection

- It is a sterile solution of sodium chloride and dextrose in water for injection.

It is clear colourless or faintly straw colored solution with pH between 3.5-6.5.

- It contains not less than 95% and not more than 105 % w/v of the stated amount of sodium chloride and dextrose as given below:

Combinations of Sodium Chloride and Dextrose

%of Sodium Chloride	%of Dextrose	%of Sodium Chloride	%of Dextrose
0.11	5	0.45	5
0.18	5	0.45	10
0.20	5	0.90	2.5
0.225	5	0.90	5
0.3	5	0.90	10
0.33	5	0.90	25
0.45	2.5		

Potassium Replacement

- Potassium Chloride: KCl (MW 74.56).
- Potassium chloride contains not less than 99 % calculated with reference to dried substance.
- It occurs as white crystalline solid, cubic crystals. It is less soluble in water than sodium chloride, and slightly more soluble in boiling water, soluble in glycerine and insoluble in alcohol.

- Use: Electrolyte replenisher in potassium deficiency, familial periodic paralysis, myasthenia gravis.
- Contraindication: renal impairment.
- **Potassium Chloride injection**
- **Ringer injection**

Calcium Replacement

- Calcium Lactate: MW 308.30
- Calcium chloride contains not less than 97% and not less than 103% of Calcium Chloride dihydrate.

It occurs as white odourless powder, it is soluble in water, practically insoluble in alcohol.
- Use: An excellent source of calcium in oral treatment of calcium deficiency.



THANK YOU