MATERIAL AND METHOD
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The study of serum electrolytes was done on three groups of patients, 15 to 75 years under going surgery and requiring fluid infusion for at least 24 hours post operatively.

The patients were divided into three groups according to nature of fluid infused in post operative period.

Group I : 3 lit. of Dextrose 5% /day
Group II : 1 lit. of Isotonic saline 2 lit. of Dextrose 5% /day
Group III : 2 lit. of Isotonic saline 1 litl of Dextrose 5% /day

Investigation
1. Blood pressure - Lying down
   - Sitting posture
2. Haematocrit
3. Serum studies - S.Sodium
   - S.Potassium
   - S.Osmolality
   - Blood sugar level
   - Blood urea level
4. Urine analysis - Volume / 24 hours
   - Urine sodium excretion
   - Specific gravity
On the day before operation patients were starved from midnight except in emergency surgery. The intravenous fluid was administered through peripheral veins. All the patients were either operated under general anaesthesia or in spinal anaesthesia. The analgesic given during perioperative or postoperative period was similar. The blood sample taken at 0900 hour from peripheral vein on day 1 (one day prior to operation, 'O' immediate postoperative day, +1 (first postoperative day), +2 (second postoperative day) and subsequently, by standard technique with a sterilized syringe and needle.

24 hours urine was collected or patient was catheterized to measure exact 24 hours urine volume.

The serum sodium, potassium and urinary Sodium were measured by flame photometer in the department of Biochemistry, M.L.B. Medical College, Jhansi.

Principle- When small quantity of metal salts such as sodium or potassium is introduced into a flame, a characteristic light is emitted. The measurement of the intensity of such emission and its correlation with the concentration of the element is the basis of flame photometry.
The instrument made on this principle is called flame photometer. The flame photometer has the following parts.

1. Air pressure regulator and flow meter for the fuel gas.

2. Atomizer

3. Burner

4. Optical system

5. Photocells

6. Recorder - A galvanometer with light spot or needle for the fuel gas, cooking gas cylinder is convenient. Compressed air is used to atomize the sample and carry it to non luminous flame. Both gas and air supplies are carefully regulated to maintain constant flow rate of the samples into the flame.

    The solution is sprayed as a fine mist of droplets in the non luminous flame which becomes coloured by the characteristic emission of the metal light of wave length which corresponds to the element being determined is isolated by the use of light filter or prism system and allow to fall on photocells. The electric current generated is measured. This is indicated by the light spot on the recorder.
Determination of serum sodium & potassium & urinary sodium

Material and reagents

1. Flame photometer
2. Gas cylinder
3. Polythene & bottles (500 mg) for standard solution
4. Polythene container for distilled water
5. Polythene small cuvettes for aspirating test solution in flame.
6. Double distilled or deconized water
7. Polythene small tubes
8. Stock sodium standard (200 meq/l.) dissolve
   11.69 gm of pure dry sodium chloride (NaCl) in one lit. of water.
9. Stock potassium standard (10 meq/l.) dissolve
   .746 gm of pure dry potassium chloride (KCl) in one lit. of water.
10. Combined working standard of sodium & potassium

Procedure

Sodium - Put the light filter (580 - 590 mon yellow green) in the filter socket, adjust the gas adjusting knob gradually untill individual blue cones of flame become separated. Then adjustment of glavenometer is done. First with distilled water and than with minimum strength working solution. Than aspirate one by one standard solution and note the glavenometer reading and than calculated sodium levels.
**Potassium** - The potassium light filter (766-700 mm Red) The instrument is standardized and the same test solution is aspirated and reading is noted and potassium value calculated.

**Urinary sodium** - Dilute the urine 1 to 100 ml and measurement is done as for blood sodium.

It is sometimes helpful to calculate osmolality from the molar concentration of main osmotically active substances. For both serum & urine this can be done if molar concentration of so (Na⁺), K⁺ urea and glucose and known. The serum osmolality is calculated by formula (Harrison's principle of internal medicine II D.N. 1791).

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3.0 \text{Osmolality (osmol/L)} = 2(\text{Na}^+) + (\text{K}^+) + \frac{\text{Glucose (mg/100ml)}}{18} + \frac{\text{Urea (mg/100ml)}}{2.8}
\]

For most normal sera this is close to \(2(\text{Na}^+ + \text{K}^+)\) and for normal urine glucose can be ignored comparison of calculated osmolality with that actually determined is often helpful in pointing to the presence of some previously unsuspected osmotically active substance.

The specific gravity of urine was measured by urometer.

The weight of patient was recorded weight 0200 hours each day after correcting it for the weight loss resulting from the removal of surgical specimens.
Intravenous fluid given

All groups of patients received identical volumes of fluid in early post operative period, i.e., 3 lit./day. But nature of fluid was according to group already mentioned.

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