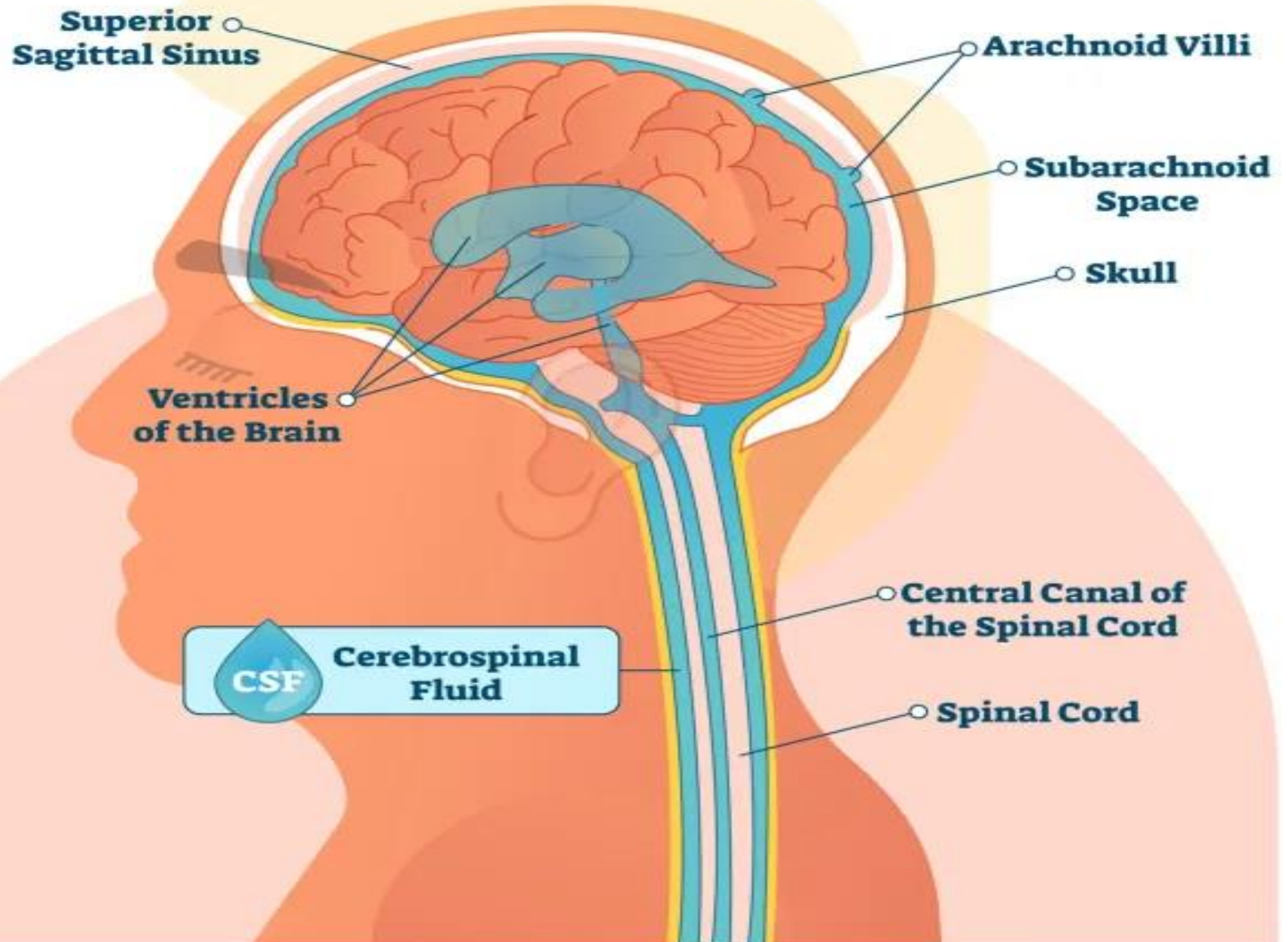


CEREBROSPINAL FLUID



Cerebrospinal fluid

CSF: is a clear colorless fluid placed in intraventricular and subarachnoidal spaces, round brain and spinal cord resorbed to venous (80%) and lymphatic (20%) systems.

Functions of cerebrospinal fluid

- Mechanic protection of brain and spinal cord, protection against microorganisms
- Transport of biomolecules to the brain
- Clearance of catabolites (CO_2 , lactate)
- Maintenance of constant intracranial Pressure

Sugar in CSF

Normal

The sugar content of normal lumbar fluid is usually between 50-80mg/100ml , its value is about 60% of blood sugar value .

Decrease

The most important pathological change is the decrease which occur in meningitis and hypoglycemia.

Increase

Small increase are found in some cases but in diabetes mellitus there is high increase in CSF glucose

Determination of CSF glucose

1

In centrifug tube put 3.7ml of isotonic solution add 0.1ml of CSF sample, 0.2ml of sodium tungstate

2

Shake then centrifuge

3

take 1ml of supernatant fluid into test tube mix with 1ml of benedicts reagent

4

cover this solution with cotton and place in boiling water bath for 10 minutes

5

then cool the mixture, add 3ml of arseno-molybdc solution, add 5ml of water, read at 700nm

Chloride in CSF

normal

Normally CSF contain 120-130mEq/L of chloride (700-760mg/100ml) , this value higher than that found in plasma (98-106mmol/L)

Decrease

There is a reduction in CSF chloride in meningitis disease and when there is marked reduction in plasma chloride in diseases not involving the CNS (vomiting and burns) also accompanied by low concentration of CSF chloride.

Increase

In hypertension and in renal disease there is increase in CSF chloride

Determination of CSF chloride

In a test tube put 2-3 ml of D.W, add 1ml of CSF, then add 2 drops of potassium chromate and titrate with silver nitrate solution

appearance of **brick red color** indicate the end point which refer to the formation of silver chromate after the reaction of all chloride found in the sample with the added silver nitrate solution.

Protein in CSF

The protein of normal lumbar fluid lies between 15-45mg/100ml is almost entire albumin, normally CSF contain 60% albumin, 8% immunoglobulin and 32% other proteins.

An increase in the total protein is the commonest abnormality and this result from the breakdown of the blood CSF and brain CSF barriers as a result of inflammation reaction.

The extent which protein rise is important for the diagnosis of the diseases in meningitis, polyneuritis, and tumors.

Determination of CSF protein

1. Turbidimetric methods
mainly used

2. Colorimetric methods depend
mainly on biuret method

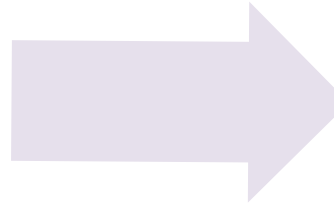
Turbidimetric methods

are simple and quick but they are affected by several facts which modify the particle size produced.

1. Temperature affects the turbidity so the samples and standards should be measured at the same temperature.
2. The presence of red cell and bacteria lead to interference.
3. Also contamination of CSF with blood affect on results due to the presence of plasma proteins

Procedure

in the test
tube mix 1ml
of CSF with
4ml of 3%
trichloroacetic
acid



wait 10
minutes then
mix and read
the optical
density of the
turbid solution
at 450nm .

Thank you