ACCESS TO CEREBROSPINAL FLUID

LUMBAR PUNCTURE

Summary

A lumbar puncture should be carried out under certain specific circumstances which are covered in detail elsewhere.

The procedure should be carried out by a paediatrician or advanced neonatal nurse practitioner, assisted by a neonatal nurse.This is an aseptic procedure.

No practitioner should have more than 2 attempts at the procedure

Equipment

Sterile wound care pack

‘Yale’ spinal needle 22 G 1.5 inch

Spinal manometer with 3-way tap (if measuring CSF pressure)

Aqueous antiseptic cleaning fluid

Sterile universal containers and glucose assay bottle

Plain bottle for protein assay.

Procedure

All babies of 32 weeks gestation and over should have sucrose given prior to LP or ventricular tap.

1. Place baby in the lateral recumbent position with gentle flexion of the back. This position carries potential morbidity from respiratory embarrassment, and it is suggested that this risk may be minimised by partial neck extension (1) Alternatively the sitting position may be adopted with the spine and hips flexed and the head supported (1)
2. Make a sterile field and clean the whole area with antiseptic solution.
3. Introduce the spinal needle with the stylet in the midline between L3 and L4, below the level of the termination of the spinal cord. The L4 spinous process lies on the line joining the iliac crests. Direct the needle steadily towards the umbilicus. The use of a hypodermic needle should be avoided as this carries a theoretical risk of introducing a dermoid.
4. The "double give" as the ligamentum flavum and dura are penetrated is usually very subtle (2), so it is necessary to advance the needle gradually and remove the stylet frequently until CSF is obtained.
5. If measurement of CSF pressure, and drainage of CSF is required attach the manometer to the end of the needle and measure the opening

pressure. Allow the CSF to drip into the universal container, removing the required quantity, approximately 10-20 ml/Kg (3,4,5). **The CSF should never be aspirated as this may be associated with cerebral haemorrhage**.
Measure the closing pressure before removing the needle.

6. When taking samples for microbiology collect approximately 6 drops in 2 universal containers. A sample for glucose assay should also be collected.
7. Remove the needle, spray the puncture site with "Op-site" spray dressing and apply a sterile gauze square

Samples should be sent to Microbiology for microscopy, gram stain, C&S and protein assay. **Glucose assay should be carried out on the unit, using the blood gas analyser** to be compared with a blood glucose taken prior to the procedure (6).

If the baby demonstrates a high index of suspicion. samples for microscopy and gram stain should be sent to microbiology urgently, regardless of time of day,

The procedure and results should be recorded accurately in the medical notes.

Contraindications

A bleeding diathesis
Low platelet count i.e. <30
A lumbosacral abnormality

VENTRICULAR TAP

Summary

Ventricular tap is carried out to:

1. diagnose or exclude ventriculitis
2. to measure CSF pressure and drain CSF in non-communicating hydrocephalus

The procedure should be carried out by a paediatrician or Advanced neonatal nurse practitioner, assisted by a neonatal nurse.

No practitioner should have more than 2 attempts at the procedure.

Equipment

As for lumbar puncture

Procedure

1. Shave the scalp over the lateral angle of the anterior fontanelle. It is usual to tap the most dilated lateral ventricle, although when performing serial taps, it is usual to tap alternate lateral ventricles.

2. Position the baby in the supine position, the head in the neutral position, towards the operator, being held securely by the assistant

3. The procedure must be carried out under strict aseptic conditions. Create a sterile field and clean the skin with the antiseptic solution.

4. Insert the spinal needle with stylet smoothly into the lateral angle of the fontanelle, directing it towards the inner angle of the ipsilateral eye.

   Advance the needle smoothly, avoiding changing direction to minimise risk of causing trauma to the brain tissue.

5. Advance the needle steadily, removing the stylet at regular intervals until CSF drips out.

6. Attach the 3-way tap and manometer to the needle to measure the opening pressure of the CSF. Allow the CSF to drip into the universal containers, removing the required quantity: approximately 10-20 mls/kg has been found to be effective (6).

   NEVER remove the CSF by syringe as this could precipitate fresh intraventricular haemorrhage (6).

7. Re-attach the 3-way tap and manometer to the needle to measure the closing pressure of the CSF.

8. Remove the needle, spray the site with "Op-site" spray dressing and apply a sterile gauze square.

Samples should be sent to microbiology for microscopy, gram stain, C&S and protein levels. A CSF glucose should be carried out on the unit using the blood gas analyser to be compared with a true blood glucose and lactate taken prior to the procedure (6).

If ventriculitis is suspected the samples must be sent to microbiology immediately regardless of time of day.

Contraindications

A bleeding diathesis
Low platelet count i.e. <30

The procedure and results should be recorded accurately in the medical notes

References

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