UMBILICAL CORD BLOOD GAS SAMPLING GUIDELINE

1. OPTIMAL OUTCOMES
   • To safely obtain arterial and venous umbilical cord blood samples

2. PATIENT
   • A neonate with any of the following risk factors:
     • Scalp pH performed in labour
     • Expedited delivery for non reassuring heart rate
     • Instrumental delivery
     • Shoulder dystocia
     • Vaginal breech delivery
     • Apgars < 7 at 5 minutes
     • Emergency caesarean section
     • Small for gestational age baby
     • Intrapartum haemorrhage
     • Planned neonatal admission
     • Paediatrician present at birth

3. STAFF
   • Registered midwives
   • Medical Staff

4. EQUIPMENT
   • 2 umbilical cord clamps
   • Alcohol wipes
   • 2 preheparinized arterial blood gas syringes (size 30)
   • 2 safety needles (21G)
   • 2 pairs of gloves
   • Goggles / face shield
   • Maternal identification labels

5. CLINICAL PRACTICE
   • Attach 21G safety needles to heparinized arterial blood gas syringes
   • Affix maternal label. Identify one arterial, one venous
   • Isolate a 10cm segment of umbilical cord between two sets of clamps immediately after birth
   • Identify one artery and vein separately
   • Place isolated segment of cord into holder (where available), clean segment of cord
   • Insert needle and withdraw a minimum of 0.2 mls of blood from the artery. If sample is smaller than 0.2 mls perform lactate analysis
   • Repeat the procedure with the vein no mixing. The thickness of the vein will support the thinner artery aiding sample collection
   • Close safety shield over needle whilst withdrawing from vessel
   • Remove safety needle and expel any air from syringe
   • Cap with stopper provided
   • Invert tube and mix specimen
   • Analyse cord blood gases on blood gas analyser in Delivery Suite
   • Print 2 copies of the cord gas results

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UMBILICAL CORD BLOOD GAS SAMPLING GUIDELINE  cont’d

- Inform paediatric and obstetric registrars if arterial cord gas blood result is pH <7.1, lactate >4 or base excess -10
- Place one copy of cord gas results in neonates notes and handwriting results in neonates and maternal notes
- Attach a copy of the cord blood gas results to pathology request form, document neonatal identity and identify sample as cord blood gas on form and send to pathology
- Attach a copy of the cord gas results to pathology request form and document neonatal identity and send to pathology

Umbilical blood samples must be taken and analysed within 1 hour from the clamping of the cord

6. HAZARDS/SUB-OPTIMAL OUTCOMES
- Needle stick injury
- Occupational exposure
- Inaccurate identification of umbilical vessels
- Perforating back of artery and collecting venous blood by mistake, and vice versa
- Clotted blood samples

7. DOCUMENTATION
- Neonate integrated notes
- Maternal sticky labels

8. EDUCATIONAL NOTES
- The analysis of blood from the umbilical arteries provides objective information on the acid-base status of the neonate
- Venous cord blood reflects a combination of maternal acid-base status and placental function
- Together, arterial and venous cord blood provides information on the occurrence, timing, and possible cause of oxygen deficiency
- It is imperative to clamp the cord immediately after delivery and before or as near the first breath as possible. Umbilical blood acid-base values can change significantly within only 5 seconds of neonatal breathing after delivery
- Once the umbilical cord has been double clamped, it can be left at room temperature for 60 mins without clotting or significant changes in pH, PO2, or PCO2
- A cord base excess of -12 mmol/l is associated with encephalopathy in 10% of neonates

9. RELATED POLICIES/ PROCEDURES/GUIDELINES
- Intrapartum fetal heart rate monitoring
- Fetal Blood Sampling – Intrapartum
- Neonatal Resuscitation

10. REFERENCES

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