FETAL BLOOD SAMPLING (FBS) – INTRAPARTUM

This LOP is developed to guide clinical practice at the Royal Hospital for Women. Individual patient circumstances may mean that practice diverges from this LOP

1. AIM

- Assess fetal acid-base balance/lactate status in labour

2. PATIENT

- Woman in labour with ruptured membranes, cervical dilation ≥ 3cm and a well applied presenting part

3. STAFF

- Medical and midwifery staff accredited to perform FBS

4. EQUIPMENT

- Light source
- Fetal blood sampling tray
- Chlorhexidine 0.02%
- Chlorhexidine gluconate 1% obstetric care cream
- Lactate machine

5. CLINICAL PRACTICE

- Interpret the cardiotocograph (CTG) in the context of the pregnancy, woman, fetus and the labour
- Identify the indication for fetal blood sampling (FBS), and ensure all prerequisites are met
- Do not perform FBS if any of the following contraindications are present:
  - blood born infection (HIV or Hep C or Hep B)
  - active genital herpes simplex
  - known fetal bleeding disorders such as haemophilia
  - gestation < 34 weeks
  - face presentation or non-vertex presentation
  - < three cm dilation
  - clear evidence of acute compromise warranting immediate delivery
- Explain the limitations of CTG to the woman and hence the rationale for FBS including:
  - more accurate prediction of fetal welfare in labour
  - avoidance of unnecessary instrumental or operative delivery
- Advise woman that lactate > 4.8 would require expedited delivery
- Obtain verbal consent and document
- Perform abdominal palpation to confirm lie, engagement, presentation
- Perform a vaginal examination for dilation, effacement, presentation, position, moulding, caput, and station. Document in medical record
- Note the presence or absence of fetal reactivity following vaginal examination
- Get equipment ready and ensure lactate machine ready to receive sample
- Place the woman into left lateral or lithotomy position
- Clean and drape vulva using aseptic technique
- Insert amnioscope to identify the cervix and fetal scalp and withdraw the trochar
- Clean the area of fetal head to be sampled with gauze to remove liquor, blood or meconium
- Apply paraffin jelly to fetal scalp to encourage beading of blood
- Pierce the fetal scalp
- Collect blood straight into capillary tube (held in the appropriate capillary tube holder)
- Hand specimen to midwife

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- Recollect second specimen if inadequate first sample
- Apply pressure using a gauze to fetal scalp to stop bleeding
- Document results and explain to the woman
- Interpret Results:
  - lactate **< 4.2**, continue labour and further management would be determined by CTG and clinical features. If the CTG remains abnormal red, then repeat FBS [7] no sooner than 30mins
  - lactate **4.2 - 4.8** repeat after no more than 30 mins if the CTG remains abnormal red
  - lactate **> 4.8** arrange for immediate delivery
- Consider previous lactate results, rate of progress, and other clinical information

7. DOCUMENTATION

- Medical records

8. EDUCATIONAL NOTES

- Metabolic acidosis in the fetus occurs when there is reduced oxygen transfer to the fetus requiring a shift to anaerobic metabolism which leads to an oxygen debt and accumulation of lactic acid
- FBS more accurately detects metabolic acidosis secondary to hypoxia than the CTG
- FBS should be undertaken to assess for acidemia in the presence of an abnormal red CTG unless there is clear evidence of acute compromise in which case immediate delivery should occur
- An abnormal red CTG has 1 or more abnormal features or 2 or more non-reassuring features [7]
- CTG has strong negative predictive power but poor positive predictive value. Over-reliance on CTG alone to measure intrapartum fetal welfare would increase unnecessary intervention without improving neonatal outcomes [5]
- Measuring lactate over pH is preferred because:
  - less blood is required which reduces contamination sample failure[8] and delay in management
  - it is a more accurate reflection of acid/base balance in the setting of:
    - cord compression where temporary cessation of circulation causes an accumulation of CO2 and a transient respiratory acidemia without an oxygen debt [3]
    - periods of early hypoxia for which lactate is an earlier marker because pH can normalise more quickly following fetal compensation [4]
  - lactate measurement is simple and easy to perform
- Lactate results may be affected by stage and length of labour[3], machine profiles [1,3], sampling over caput or other contamination of the sample (meconium, amniotic fluid), and maternal hyperventilation [6]
- There is a paucity of evidence around FBS on breech presentation. Some experts agree that the available evidence suggest that buttock FBS gives an accurate reflection of the acid-base status of the fetus and can therefore be considered [2]

9. RELATED POLICIES / PROCEDURES/ CLINICAL PRACTICE LOP

- NSW Health. Guideline. Maternity - Fetal Heart Rate Monitoring. GL2018_25
- Assisted vaginal birth guideline – SESLHDGL/050
- First stage labour care for women with a low risk pregnancy
- First stage labour – recognition of normal progress and management of delay

FETAL BLOOD SAMPLING (FBS) – INTRAPARTUM cont'd

- HIV in Pregnancy
- Hepatitis B Positive mothers and their babies
- Hepatitis C positive mothers and their babies
- Herpes simplex
- CERS calling criteria

10. NATIONAL STANDARD

2. Standard 5 – Comprehensive Care

11. RISK RATING

3. Low

12. REFERENCES

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3. East CE, Leader LR, Sheehan P, Henshall NE, Colditz PB, (2015) Intrapartum fetal scalp lactate sampling for fetal assessment in the presence of a non-reassuring fetal heart rate trace (Review) Cochrane Database of Systematic Reviews Issue 3. Art. No.: CD006174. DOI: 10.1002/14651858.CD006174.pub2.
4. Heinis AMF, Spaanderman ME, Klein Gunnewiek JMT, Lotgering FK. Scalp blood lactate for intra-partum assessment of fetal metabolic acidosis. Acta OG Scand 2011; 90:1107-14.
5. Holzmann M, Cnattingius S, Nordstrom L. Outcome of severe intrapartum acidemia diagnosed with fetal scalp blood sampling. J Perinat Med 2011; 39:545-8.
6. Jørgensen JS, Weber T. Fetal scalp blood sampling in labor – a review. Acta Obstet Gynecol Scand 2014; 93:548 – 555.
7. Liljestrom A, Wikstrom A-K, Hanson U, Akerud H, Jonsson M. Evaluation of the discrepancy between pH and lactate in combined fetal scalp blood sampling. Acta OG Scand 2011; 90:1088-93.
8. NICE Guideline: Intrapartum Care. 2017, 1.10.40 nice.org.uk/guidance/cg190/chapter/recommendations#fetal-blood-sampling
9. Ramanah R, Martin A, Clement M-C, Maiilet R, Riethmuller D. Fetal scalp lactate micro sampling for non-reassuring fetal status during labor: a prospective observational study. Fetal Diagnosis and Therapy 2010; 27: 2714-19
10. RANZCOG Guideline: Intrapartum Fetal Surveillance. Clinical Guideline – 4th Edition, 2019.

REVISION & APPROVAL HISTORY

Reviewed and endorsed Maternity Services LOPs group 10/3/19
June 2017 – Amendment to No 4, 14th dot under Interpret Results – word immediately removed after DELIVER – recommended by Trigger review
Nov 2016 – amendment to No 5, 5th dot under Interp0ret Results – changed from ≥ to >4.8
Approved Quality & Patient Safety Committee 18/7/13
Reviewed and endorsed Maternity Services LOPs group 15/7/13
Approved Patient Care Committee 6/12/07
Reviewed Obstetrics Guidelines Group September 2007
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Endorsed Maternity Services Clinical Committee 13/6/06

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