Cervical Ripening and Labor Induction

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OBJECTIVES

• Describe Indications for Inducing Labor
• Differentiate Between a Favorable and Unfavorable Cervix
• Identify Criteria for cervical Ripening and Induction of Labor
• Discuss Specific Methods for Cervical Ripening and Induction of Labor
• Discuss Assessments, Interventions, Communication and Documentation

Terminology

• Labor
• Induction of Labor
• Cervical Ripening
• Augmentation of Labor
• Tachysystole

Incidence

• one in four pregnant women
• doubled since 1990

(ACOG 2009; Bakker 2013; Simpson 2013)

The Final Weeks are Important!

• Fetal Lungs Mature
• Fetus Coordinates Sucking and Swallowing
• Maternal Antibodies are Stored
• Iron is Stored
• Weight Gain
• Brown Fat Stores
• Hormones Ripen the Cervix
• Fetus Descends

Potential Risks of Induction

• Cesarean Section
• Hemorrhage
• Infection/Sepsis
• Uterine Dystocia
• Fetal Distress
• Breathing Problems
• Feeding Problems
• Blood Sugar Instability
• Temperature Instability
Medical Indications

- Abruptio placentae
- Chorioamnionitis
- Fetal Demise
- Gestational/Chronic Hypertension
- Preeclampsia, eclampsia
- PROM
- Post-term pregnancy
- Maternal Medical Condition (Diabetes, renal disease)
- Fetal Compromise (IUGR, Oligohydramnios)
  (ACOG 2009)

Psychosocial Issues:
Partner leaving town, prolonged military engagement
Family in town
Anxiety/Depression
Adoption
Maternal Discomfort
Maternal Exhaustion

Logistical Reasons:
History of Rapid labor, remote from hospital

(ACOG 2012; 2013; Simpson 2013)

Elective Induction of Labor is discouraged because it is often performed for the convenience of women / provider and spontaneous labor is associated with fewer complications

Contraindications

- Vasa previa or complete placenta previa
- Transverse fetal lie
- Umbilical Cord Prolapse
- Previous classical cesarean birth
- Active genital herpes infection
- Previous myomectomy entering the endometrial cavity

Prior to Induction of Labor

- Gestational Age Assessment
- Patient Counseled
- Availability of appropriate nursing staff
- Assessment of cervix, pelvic adequacy, fetal size, presentation
- Ability to monitor FHR/Contractions
- Physician capable of performing a cesarean delivery readily available

Confirmation of Term Gestation

- Ultrasound measurement at less than 20 weeks of gestation supports gestational age of 39 weeks or greater
- Fetal heart tones have been documented as present for 30 weeks by Doppler ultrasonography
- It has been 36 weeks since a positive serum or urine hCG pregnancy test result
ACOG Committee Opinion
April 2013
Medically Indicated Late-Preterm and Early-Term Deliveries

- Late Pre-term (34 0/7 – 36 6/7)
- Early Term (37 0/7 – 38 6/7)

Determine the Bishop Score

- Medium consistency
- Posterior Position
- -4 Station
- 60% effaced
- 2cm’s dilated

Methods for Cervical Ripening

Pharmacological
- Prostaglandins
  - Dinoprostone PgE2 (Gel, cervidil)
  - Misoprostol PgE1

Mechanical
- Hygroscopic Dilators (laminaria)
- Balloon Catheters
- Membrane Sweeping/Striping
- Amniotomy

Dinoprostone PgE2

Cervidil (Vaginal Insert)
- Place posterior vaginal fornix
- Controlled release over 12 hours
- Delay oxytocin administration for 30 – 60 minutes
- Not Recommended for previous cesarean / uterine scar

Misoprostol (Cytotec) PgE1

- 25 mcg (1/4 tablet) posterior vaginal fornix every 3-6 hours, up to 6 doses in 24 hours
- Delay oxytocin administration for 4 hours after last dose
- Uterine tachysystole is more common
- Not Recommended for previous cesarean / uterine scar
The FDA in 2002 approved a new label on the use of misoprostol during pregnancy for cervical ripening and for the induction of labor.

Prostaglandins

- effective cervical ripeners
- increase myometrial contractility
- not recommended for previous cesarean delivery or uterine scar

Management of Tachysystole During Cervical Ripening

Tachysystole with or without change in FHR
- Maternal repositioning
- IV Fluid bolus (500ml)
- Supplemental Oxygen
- Communication with provider/Charge Nurse
- Removal of cervidil insert (reversal in 15 mins)
- Consider 0.25 mg Terbutaline Subcutaneously

What Next...

- Ripening methods may result in labor
- Successful cervical ripening = Bishop of 7
- Repeat doses of prostaglandins
- Possible DC home with follow-up plan

Nursing Considerations During Cervical Ripening

- Monitor vital signs every 4 hours
- Rest and comfort
- Discuss plan of care and education
Oxytocin

*Most commonly used induction agent*

- Half life of 10 – 15 minutes
- Steady state in (40 minutes)

*When rate of administration is equal to rate of elimination*

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Endogenous Oxytocin

Hypothalamus  Pituitary  Circulation

Release of oxytocin by the body
- Breast Stimulation
- Sensory stimulation of lower genital tract
- Cervical stretching and pressure

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Endogenous Oxytocin

- Combined maternal-fetal effect is 5-7 mU/min
- Uterine sensitivity to oxytocin increases rapidly with onset of labor
- Surge during second stage of labor with stretching of pelvic floor receptors the Ferguson reflex (+1 station)

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Exogenous Oxytocin

- Articially manufactured
- Works same in the body
- Increases strength/frequency contractions
- Higher doses once stable phase has been reached result in low-intensity, coupling, tripling or tachysystole
- “Pit through” is a myth
- Treat desensitization with decrease or 30-60 minutes off and 500 ml bolus of Lactated Ringer

*(Simpson, 2013)*

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Exogenous Oxytocin

**Goal:**

*Give the minimal amount required to achieve effective contraction pattern with labor progress*

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Tachysystole

- Tachysystole is most concerning side effect of oxytocin
- decreases perfusion/fetal oxygenation
- Fetal Injury from Tachysystole is completely preventable

*(Simpson, 2013; Helwick/Mahony 2012)*
Common Allegations

**Oxytocin misuse in ~50% cases**

- Failure to accurately assess maternal-fetal status
- Excessive doses of oxytocin
- Mistaken administration of oxytocin bolus
- Failure to recognize/treat tachysystole

(King, 2012; Simpson, 2008, 2013)

- Follow hospital protocol
- Standard concentration (1 ml/hr = 1 mU/min)
- Connect Oxytocin at most proximal IV port
- Standard Order Sets
- One to One Nursing Care

(ACOG, 2009; Simpson, 2013; Clark, 2007)

Monitor your patient closely:

- FHR and UC
- Every 15 mins in 1st stage of labor
- Every 5 mins during second stage
- At each oxytocin dose change
- Vital Signs and other parameters per protocol
- Clear Communication with Charge Nurse and Provider
- Know your hospital/unit chain of command

**Oxytocin Dosages for Induction**

Low-Dose:
- 0.5 – 2 mU/min starting
- 1 -2 mU/min increase every 15 – 40 mins

High-Dose:
- 6 mU/min starting
- 3-6 mU/min every 15 – 40 mins

ACOG 2009
Low Dose VS High Dose Oxytocin

Low- or High-dose oxytocin regimens are appropriate for women in whom induction of labor is indicated

Low dose regimens are associated with decreased tachysystole and associated FHR changes

Oxytocin-Induced Tachysystole (Normal FHR)

- Maternal reposition
- IV fluid bolus 500 ml LR
- If not resolved in 10–15 mins, decrease by ¼
- If not resolved after decrease in 10-15 mins discontinue
- If discontinued for 30 mins or more, re-start at initial dose ordered

(Simpson, 2013)

Oxytocin-Induced Tachysystole (Category II / III FHR)

- Discontinue oxytocin
- Maternal reposition (left/right lateral)
- IV fluid bolus 500 ml LR
- Consider oxygen at 10 L via non-rebreather
- Consider Terbutaline 0.25 mg SQ
- Resume oxytocin after resolution at ½ previous rate if less than 20–30 mins
- If oxytocin off longer than 30 mins, resume at initial dose ordered

(Simpson, 2013)

Summary

There are times when benefits of inducing labor will outweigh the risks of continuing pregnancy

Careful assessment, monitoring and interventions

Induction is more successful with a favorable cervix

Oxytocin is a high alert medication, standardized approach to administration reduces error and injury

Checklist Based Protocols

- Evidenced Based
- Multidisciplinary Team Effort
- Double check/back-up
- May improve outcomes
- May reduce cesarean rates
- May reduce litigation claims
- Successful QI demonstrated in other industries, NASA, Airline, Military