433 Teams

OBSTETRICS & GYNECOLOGY

L10 - Induction of Labor (IOL)

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Objectives:

1) Differentiate between IOL and augmentation of labor.

2) List the indications and contraindications for IOL.

3) List the methods used for IOL and their complications:
   3.1) Mechanical
   3.2) Artificial rupture of Membranes(ARM)
   3.3) Pharmacologic:
   - Prostaglandin
   - Oxytocin

Abbreviations:
IUGR : intrauterine growth restrictions
PROM : premature membrane rupture
RH : rhesus
C/S : Cesarean section
I.V : intravenous
T1/2 : plasma half-ife

Definitions:

Induction:

Is the process whereby labor is initiated by artificial means after appropriate assessment of the mother and fetus.
In the case of **high-risk pregnancies**, induction is necessary to **reduce** the risk of morbidity to the mother and her fetus, and it **should not be done before 38 weeks**' gestation because of the possibility of neonatal morbidity.

Augmentation:

is the artificial stimulation of labor that has **begun spontaneously.**

Most Important:

Cervical effacement and softening (**ripening**) occur before the onset of spontaneous labor. Cervical ripen-ing frequently has not occurred before a decision to induce labor, **yet the success of induction is dependent on these changes in the cervix**.

	Induction	Augmentation
Indication	*Maternal*: • Pre-eclampsia • DM • Heart disease	• Prolonged labor " Inadequate uterine activity" • Prolonged latent phase • Prolonged active phase] Stage 1 labor
	Feto-placental: • Prolonged pregnancy • IUGR , PROM • Abnormal fetal testing • Rh type incompatibility • Fetal abnormality, oligohydramnions • Chorioamnionitis	**Pre-term (IOL) is indicated only when the continuation of pregnancy represents a significant risk to the fetus or mother.**
Contra-indication	*Maternal*: ➢ **Absolute**: contracted pelvis. ➢ **Relative**: uterine surgery ➢ Classic C/S ➢ Complete dissection of uterus (myomectomy, reconstruction) ➢ Over-distended uterus	Same contraindications as induction (maternal and Feto-placental)
	Feto-placental: ➢ Acute fetal distress, Abnormal presentation ➢ Placenta previa **or** Vasa previa **or** umbilical cord prolapse. ➢ Preterm fetal w/o lung maturity	

- **MUST confirm the Gestational Age.**

- Pre-term fetus: The only treatment is to induce delivery , after giving the fetus **steroid** for lung maturation; be accelerated within 24-48 hours (If delay does not harm fetes or mother).

- fetal maturity should be confirmed by either appropriate **pregnancy dating**, **ultrasonic measurements** or **amniotic fluid analysis** (e.g., lecithin/sphingomyelin [L/S] ratio).

Methods: Several mechanical & pharmacologic approaches may be used to promote cervical ripening before the actual induction of uterine contractions.

Pharmacological:

1. intravaginal application of **prostaglandin E2** using a vaginal insert (on a string) called **Cervidil,** which can be removed quickly if the medication causes hyper-stimulation.

2. **Cytotec,** a synthetic **prostaglandin E1** analogue, has also been approved for cervical ripening. One 25-µg tablet placed intravaginally effectively initiates cervical ripening.

Mechanical:

1. Intrauterine placement of a **Foley catheter** into the cervix and inflation of the balloon with 10 cc of saline. It helps the cervix to produce prostaglandins naturally.
   we use it when there is previous C/S because of (scars).
2. **laminaria tent** (absorb water and swell gradually to dilate cervix ,we do not use it because of its side effect such as infection).

Artificial:

1. Manual separation of the chorioamnion from the lower uterine segment referred to as "stripping the membranes" does not necessarily speed up the onset of labor. **Artificial rupture of the membranes is not recommended** as a method to induce labor.
2. **Oxytocin** (after amniotomy when the cervix is favorable **= high Bishop score**.)

- Although prostaglandin administration has been demonstrated to shorten the duration of labor induction, the impact on C/S rates due to failed induction has been minimal.

- if we give oxytocin without amniotomy, this can lead to **amniotic fluid embolism!!**

Hospital Guidelines:

For the proper use of oxytocin for induction and augmentation of labor,

- ✓ It is helpful to assess the likelihood of success by **a careful pelvic examination** to determine the ***Bishop score:***

Evaluate the cervix status and station of fetal head:
A **high score** (9 to 13) is associated with a high likelihood of a vaginal delivery,
A **low score** (<5) is associated with a decreased likelihood of success (65-80%).

TABLE 8-3

BISHOP SCORE TO ASSESS LIKELIHOOD OF SUCCESSFUL INDUCTION OF LABOR

Physical Findings	Rating			
	0	1	2	3
Cervix				
Position	Posterior	Mid	Anterior	—
Consistency	Firm	Medium	Soft	—
Effacement (%)	0-30	40-50	60-70	≥80
Dilation (cm)	0	1-2	3-4	≥5
Fetal Head				
Station	–3	–2	–1	+1

In patients with **a low Bishop** score, it is not unusual for an induction to progress slowly. If the cervix effaces and dilates, it is recommended that the membranes be **ruptured on the third day**. If adequate progress is not made within 12 hours of rupturing the membranes, **a cesarean delivery may be performed**.

Oxytocin Infusion: **Oxytocin is identical to the natural pituitary peptide, and it is the only drug approved for induction and augmentation of labor.**

1. Oxytocin must be given **I.V** to allow it to be discontinued quickly if a complication such **as uterine hypertonus** or **fetal distress** develops.
T1/2= 3 to 5 minutes, its physiologic effect will diminish quickly (within 15 to 30 minutes) after discontinuation.

2. A **dilute infusion** must be used and "piggybacked" into the main I.V line so that it can be stopped quickly; w/o interrupting the main I.V route.

3. The drug is best infused with **a calibrated infusion pump** that can be easily adjusted to deliver the required infusion rate accurately.

4. The induction of labor for a specific indication generally **should not exceed 72 hours**.

5. If adequate labor is established, the infusion rate and the concentration may be reduced, especially during **the second stage** of labor to avoid the **risks of hyperstimulation and fetal distress**.

Oxytocin Complications !!

1. Excessive infusion rate can cause **hyperstimulation** and thereby cause **fetal distress** from **ischemia**. In rare situations, a tetanic contraction can occur, which can lead to **rupture of the uterus**.

2. It has an intrinsic **antidiuretic effect** and will increase water reabsorption from the glomerular filtrate**. Severe water intoxication with convulsions and coma** can occur rarely when oxytocin is infused continuously for **more than 24 hours**.

3. prolonged infusion of oxytocin can result in **uterine muscle fatigue** (non-responsiveness) and **postdelivery uterine atony** (hypo-tonus), which can increase the risk of **postpartum hemorrhage.**

References:

- Hacker Moore's-Essentials of Obstetrics and Gynecology 6th Ed.
- Doctor's lecture
- 432 teamwork

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