

P U E R P R I U M

Bekele D(md+)

INTRODUCTION

- Postpartum period (*puerperium*) lasts from delivery of placenta until 6 to 12 weeks afterward
- Most of physiologic change in pregnancy returned to its prepregnancy state by 6 wks
 - Some need months (cardiovascular and psychological change)
 - Years (pelvic musculature and cardiac remodeling)

Early postpartum issues

- Shivering
 - 25-50 % after normal delivery
 - Start 1-30 minute and last 2-60 minutes
 - Proposed mechanism
 - FMH
 - Micro amniotic embolism
 - Bacterimia
 - Thermogenic reaction to placental separation
 - Drop in temperature after labor
 - Anesthesia related

- Management
 - Warm blankets
 - Drug for anesthesia related shivering
 - Meperidine 25 mg IV slowly over 5 minute
 - Clonidine 150 µg IV
 - Tramadol 3 mg/kg IV

Uterine Involution

- Uterus
 - 24 hr – Umbilicus (1000 gram)
 - 1 wk –Mid way b/n symphysis and umbilicus
 - 2 wks –Pubis symphysis
 - 6-8 wk –Prepregnancy (60-100 gram)
- Rate of involution
 - Parity
 - Mode of delivery
 - Breast feeding

Lochia

- Sloughing of decidual tissue
 - Rubra
 - Shading of blood and deciduas few days after delivery
 - Serosa
 - Pinkish brown somewhat malodorous
 - After 3 or 4 days
 - In 10 – 15 % can extend to 6wks
 - Alba
 - yellowish white
 - Approximately 10th day

- Amount
 - 200-500 ml over one month
 - Affected by bleeding diathesis
 - Transient increase in day 7 -14 due to slough of eschar on placental site
 - Sonographically –Endometrium lined with fluid and debris
 - Average duration of discharge ranges from 24 to 36 days

- Cervix
 - 2-3 cm in 1st few days
 - <1 cm after 1 wk
 - Never regain prepregnancy shape
- Vagina and vulva
 - Rugae restored on 3rd wk (resolution of vascularity and edema)
 - Vaginal epithelium restored by 6-10 wks may delayed in breast feeding
 - Birth trauma cause relaxation on pelvic muscle
 - Tone regained by 6 wks
 - Never regain prepregnancy state

Reproductive hormone

- hcG return to normal at 2-4 wks
- Gonadotropine and steroid remain low level for 1st 2-3 wks
- Mean return of menstruation 25-64 days
 - 70% menstruate at 12 wk
 - Delay in breastfeeding due prolactin

Thyroid function

- Increases about 30% during pregnancy and regresses to normal gradually over a 12 wk
- If on medication TFT at 6 wk and adjust the dose
- Transient autoimmune thyroiditis may develop due increase cell mediated immunity after delivery
 - Present with hyperthyroid or hypothyroid symptoms
 - Occurs in 2% to 17% of women(10%)

- PPT risk may increased to 25 % in women with type I DM
- Mild dysphoria is symptom of hypothyroidism
 - Develop in 5% to 30% of women with PPT
 - TFT to rule out postpartum depression 2-3 months after delivery
 - Thyroid supplementation is treatment
- Hyperthyroid symptoms are treated with β -blockers
 - Methimazole and propylthiouracil are also safe during lactation

Skin and Hair

- Striae fade to silvery and persist
- Chloasma resolve
- Ratio of anagen and telogen reversed
 - Hair loss (telogen effluvium) 1-5 month after delivery
 - Self limited
- Abdominal muscle strength aided by exercise

BREASTS AND LACTATION

- Breast is composed 15-25 lobe which further divided to many lobule then alveoli
- Each alveolus with a small duct joins others to form a single larger duct for each lobe
- Lactiferous ducts open separately on the nipple
- **Alveolar secretory epithelium** synthesizes various milk constituents
 - Colostrum
 - Mature milk

■ Colostrums

- Deep lemon-yellow liquid expressed from the nipples by the second postpartum day
- Rich in immunological components and contains more minerals and amino acids
- Less sugar and fat
- Secretion persists for 5 days to 2 weeks
- Conversion to mature milk by 4 to 6 weeks
- IgA offers protection against enteric pathogens

■ Breast milk

- Contain fat, proteins, carbohydrates, bioactive factors, minerals, vitamins, hormones, and many cellular products
- Nursing mother easily produces 600 mL of milk daily
- Most milk proteins are unique and include α -lactalbumin, β -lactoglobulin, and casein
- Vitamin K is virtually absent and should be supplemented
- **Vitamin D** content is low—22 IU/mL ,supplementation is recommended

Benefit of breast milk

- Provides
 - Age specific nutrients
 - Immunological factors
 - Antibacterial substances
 - Biological signals for promoting cellular growth and differentiation
 - Children have increased adult intelligence
 - Lower rates of sudden-infant-death syndrome
 - *Lower risk of breast and reproductive cancer*
 - *Decreased postpartum weight retention*

Contraindications to Breast Feeding

- Take street drugs
- Alcoholic
- Infant with galactosemia
- HIV
- Active and untreated tuberculosis
- Undergoing breast cancer treatment

Drugs Secreted in Milk

- Most drugs given to mother are secreted in breast milk
- Factors influence drug excretion
 - Plasma concentration
 - Degree of protein binding
 - Plasma and milk pH
 - Degree of ionization
 - Lipid solubility
 - Molecular weight
- Milk-to-plasma drug-concentration ratio

- To minimize infant exposure
 - Shorter half-life
 - Poorer oral absorption
 - Lower lipid solubility
 - Take after breast feeding
- Drug absolutely contraindicated
 - Cytotoxic drugs (cyclophosphamide, cyclosporine, doxorubicin, methotrexate)
 - Radioactive isotopes

Weight Loss

- Delivery of fetus placenta and amniotic fluid loss about 6 kg
- Lochia and ECF loss 2.5 Kg to 7 kg
- Not loss until 1 to 2 weeks after delivery because of postpartum fluid retention
- Has two phase
 - Ebb phase
 - Flow phase (diuresis) -- 4-7 days postpartum
- Does not reconstitute gestational weight gain
 - Diet and exercise most important for postpartum weight loss
 - Retain about 1.4 kg

- Perineal care
 - Stool softening
 - Perineal hygiene
 - Perineal floor muscle exercise
 - Episiotomy care
 - Analgesics (NSAIDs) ibuprofen or naproxen
 - Sitz bath – cold or iced bath
 - Postpone sexual intercourse until it heals

- Lab
 - Post delivery hematocrit hct
 - Predelivery anemia
 - Hemorrhage
- Venous thrombosis prevention
 - 21 -84 times increase risk
 - Mostly within 2 wks and return to baseline at 4 wk
 - Prophylaxis if other risk present
 - Early ambulation

■ Immunization

- Both inactivated and live vaccine (except **small pox**) can be given
- Home members should update vaccination like Tdap, influenza and MMR
- Anti D for Rh negative mother

■ Tuba ligation

- Postpartum within **7 days**
- Interval

Physical Activity

- Resume without delay for uncomplicated delivery
 - Walking up and down stairs
 - Lifting moderately heavy objects
 - Riding in or driving a car
 - Performing muscle-toning exercises
- No effect on lactation but decrease anxiety and symptoms of PPD

Sexual activity

- Affected by
 - Site and state of healing of perineal or vaginal incisions and lacerations
 - Vaginal atrophy secondary to breastfeeding
 - Return of libido
 - Sleep patterns
- Median time for intercourse after delivery is **6 weeks**
 - **80 %** have sexual problems at 8 to 12 weeks, including painful intercourse
 - C/S delivery has decreased incidence of dyspareunia for first **6 months** then similar with vaginal delivery

Abnormal puerperium

- After pain
 - Due hypertonic uterine contraction after delivery
 - Common in multi parous
 - Exacerbated during sulking
 - Resolve after a wk
 - If severe and persistent after pains seen
 - postpartum uterine infections
 - Ibuprofen 600 mg po qid or prn

Post C/S

- Pain may prevent optimal interaction with newborn
- Decrease ambulation
 - Increase venous thrombosis
 - Shallow breathing—atelectasis—pneumonia
- Postpartum depression – increase **3x**
- Management

Parentral Opoids

- Morphine
- Fentanyl (synthetic morphine)
- Ketamine
- Iv lidocane
- Acetaminophine

Voiding Difficulty

- Absence of micturation within 6 hrs after vaginal delivery or removal of indwelling catheter
- Presented with frequency, hesitancy, urgency, dysuria and incontinence
- Last 2-3 month postpartum
- Risk
 - Epidural anesthesia
 - Operative vaginal delivery
 - Episiotomy
 - Prolonged labor

- Management
 - Oral analgesics
 - Try at bathroom (privacy)
 - Warm bath
 - Catheterization
 - Bladder palpated abdominally
 - If she void very small
 - Intermittent or for 24 hrs and measure post voiding volume (> 200 ml)
 - Resolve after a week

Headache

- Can be related to
 - Hormonal and physiologic change
 - Sleep deprivation
 - Psychological stress
 - Fatigue
 - Neuraxial analgesia /anesthesia

- Management

- Depended on type of headache
- Consider neonate
 - Ergotamine (cause infant vomiting ,diarrhea , unstable blood pressure)
- Blood patch for postdural puncture headache

Delayed PPH

- After 24 hr to 12 wks
- Incidence 0.5 – 2%
- Cause
 - Infection
 - RPC (sub involution of placental site)
 - Bleeding diathesis (VWD)
 - Choriocarcinoma
 - Menses
 - New pregnancy complication
 - Unknown

- Evaluation
 - History and physical examination
 - Serum hcG
 - Sonography with Doppler
- Management
 - Medical
 - Oxytocin, ergometrine, hemabate
 - Surgical
 - If RPC seen
 - Medical treatment fail

Postpartum Preeclampsia /Eclampsia

- Mostly occur within 48 hr after delivery

Postpartum Cardiomyopathy

- Criteria
 - Heart failure in last month of pregnancy or 5 month postpartum
 - Absence of other cause
 - Absence of known heart disease prior to last month of pregnancy
 - LV systolic dysfunction EF <45%
- Risk factor
 - Older age
 - Multiparty
 - African descent

- Management
 - Optimize hemodynamic
 - Relief symptom
 - Long term therapy

Postpartum Neuropathy

- Usually mononeuropathy result from
 - Compression
 - Stretch
 - Transection
 - Vascular injury
- Risk
 - Macrosomia
 - Malpresentation
 - Lithotomy position
 - Sensory blockage

- Nerve involved
 - Lumbosacral trunk
 - Femoral
 - Common peroneal (fibular)
 - Lateral femoral cutaneous
- Median duration of symptoms was 2 months (2 weeks to 18 months)
- Cesarean delivery
 - Iliohypogastric nerve
 - Ilioinguinal nerve

Postpartum fever and infection

- Two fever recorded with $T^{\circ} > 38^{\circ}\text{C}$ (oral) within 2- 10 days
- Local spread of colonized bacteria is most common etiology
- Cause
 - SSI
 - UTI
 - Endometritis
 - Breast engorgement /abscess
 - Drug reaction
 - Clostridium difficile associated diarrhea
 - Septic pelvic thrombophlebitis

Episiotomy break down

- Usually localized infection to skin and subcutaneous tissue
- Incidence 0.1 -2 %
- Area appear swollen and erythematous with purulent discharge
- Risk factor
 - Prolonged second stage of labor
 - Operative vaginal delivery
 - Mediolateral episiotomy
 - 3rd and 4th degree laceration

- Management
 - Open the wound
 - Debridement of foreign material and necrotic tissue
 - Antibiotics if cellulitis develops
 - Leave to heal by granulation unless large defect
- If repair considered
 - Suture when wound granulate (2 wks Vs 2 month)
 - Postop low residue diet initially and advance to regular diet
 - Nothing placed in vagina or rectum until wound heal
 - Sitz bath and mild analgesia

Vulvar Edema

- Associated with tocolytics , forceps delivery and preeclampsia
- Severe vulvar edema is rare
 - Following forceps delivery , perineal trauma
 - Worsening of edema ,indurations , perineal pain ,leucocytosis ($>20000/\text{mm}^3$) and high grade fever
 - Consider necrotic fasciitis if
 - Tachycardia
 - Hypotension
 - Erythema

Management

- Vulvar edema
 - Broad-spectrum antibiotics that cover GAS
 - Debridement mandatory for necrotic fasciitis

Breast Engorgement

- Early
 - Due to edema and accumulated milk
 - Peak 3 to 5 days
 - Mild fever elevation (r/o infection)
 - Resolve spontaneously
 - Tight brassier
 - Avoid stimulation
 - Analgesia (paracetamol or ibuprofen)
 - Avoid bromocriptine
 - Stroke ,seizure ,MI, Psychiatric disorder
- Late – due milk accumulation

Surgical Site Infection

- Common cause of persistent fever in women treated for metritis
- 2-10 % after C/S delivery if prophylaxis is given
- Developed 4-7 days after procedure
- Wound erythema , drainage ,persistent fever
- Treatment
 - Antimicrobials
 - Surgical drainage 2x per day
 - Debridement of devitalized tissue
 - Secondary closure when granulate

Endometritis

- Risk factor
 - Route of delivery (C/S Vs vaginal delivery)
 - Prolonged rupture of membrane
 - Anemia
 - Prolonged use of internal fetal monitoring
- Diagnostic criteria
 - Fever $> 38^{\circ}\text{C}$ in the absence of other disease
 - uterine tenderness
 - Foul smelling lochia
 - Leukocytosis
- Developed within 5 days

- Management
 - Aminoglycoside and clindamycin
 - Aminoglycoside, metronidazole and ampicillin
 - Mild –po
 - Doxycycline or clindamycin

UTI

- Mostly from normal flora of bowel (E.coli, Klebsiella, Protus, Enterobactor species)
- 2.8% post c/s and 1.5 % after vaginal delivery
- Risk factor
 - Catheterization -3-10 % risk per day
 - Epidural anesthesia
 - Vaginal procedure

Cont'd

- Management
 - Fluid administration
 - Trimethoprim-sulfamethoxazole (for nursing)
 - Avoid in Infant with G6PD deficiency
 - Fluoroquinolones
 - Pediatrics cartilage and joint damage seen in animal
 - Ampicillin and gentamycin for pyelonephritis

Adnexal Abscesses

- Ovarian abscess
 - Rare
 - Caused by bacterial invasion through a rent in ovarian capsule
 - Usually unilateral & women typically present 1 to 2 weeks after delivery

■ Peritonitis

- Infrequent following C/S, rare after vaginal delivery (GAS)
- Caused by
 - Uterine incisional necrosis and dehiscence
 - Ruptured adnexal abscess
 - Inadvertent bowel injury at cesarean delivery
- Abdominal rigidity may not be prominent due to laxity
- Adynamic ileus is the 1st symptom , bowel distention
- Antibiotics for intact uterus
- Surgical management for incisional necrosis

■ Parametrial Phlegmon

- Area of induration within the leaves of the broad ligament
- Considered when fever persists >72 hrs despite IV antimicrobial therapy
- Frequently unilateral and limited to parametrium at the base of broad ligament
- May extended laterally ,posteriorly (rectovaginal septum)

■ Management

- Usually respond to prolonged use of antibiotics 5-7 days
- Surgery
 - Intensive necrosis of uterine wall
 - Hysterectomy is very difficult due involvement of cervix and LUS
 - CT directed needle aspiration

Toxic Shock Syndrome

- AFI with severe multisystem derangement
- Has a case-fatality rate of 10 to 15 %
- Causative agent
 - *S. aureus* (TSST-1)
 - Cause the clinical manifestations by provoking profound endothelial injury
 - GAS
 - *Clostridium sordellii*
- 10 to 20 % of pregnant women have vaginal colonization with *S aureus*

Management

- Principal therapy is supportive
 - Allowing reversal of capillary endothelial injury
- Antimicrobial therapy
 - Cover S.aures , GAS and polymicrobial
- Extensive wound debridement
- Hysterectomy
- Mortality rate is high

Septic Pelvic Thrombophlebitis

- Associated with endothelial injury , venous stasis and hypercoagulability
- Type
 - Ovarian vein thrombosis
 - Fever and abdominal pain with in 1 wk post partum
 - 20% visualized radiographically
 - May have nausea and other GI symptom
 - Deep pelvic septic thrombophlebitis
 - Unlocalized fever within 3-5 days
 - Absence of radiological finding
 - No response for antibiotics
- Risk of pulmonary embolism 2%

■ Management

■ Broad spectrum antibiotics

- Ampicillin +gentamicin +metronidazole /clindamicin

■ Anticoagulant

- Heparin 60 u/kg bolus then 12 u/kg/hr with target PTT 2-3 times the normal value
- LMW heparin 1 mg/kg

Clostridium difficile associated diarrhea

- Common in postpartum
- Watery diarrhea 10-15 x per day with low grade fever and crampy lower abdominal pain
- Have drug exposure
- Management
 - D/C antibiotics
 - Oral metronidazole

POSTPARTUM PSYCHOLOGICAL REACTIONS

- Mild physiologic and transient “maternity blue”
--50% to 70%
- True depression --8% to 20%
- Frank puerperal psychosis --0.14% to 0.26
- Risk factor
 - Hormonal
 - Psychosocial
 - Biologic factor

- Hormonal

- Progesterone ,estrogen and cortisol fall in 48 hr
- Abnormally sensitive for this fall

- Psychosocial

- Inadequate social support
- Marital discord or dissatisfaction
- Financial difficulties
- Loss of employment
- Adverse perinatal outcome

- Biologic vulnerability
 - Previous history of depression
 - Family history of mood disorder
 - Depression during current pregnancy
 - Recurrence rate 90%

- Postpartum blues
 - Up to 85% of women affected
 - Rapidly fluctuating mood, tearfulness, irritability, anxiety
 - Symptom peak on 5th day and spontaneously remit within 2 wk
 - Not affect child care
 - Management
 - Support and reassurance
 - Evaluate if persist

- Postpartum depression
 - Interfere with child care and self care
 - Occur in 10-15 %
 - Develop most commonly in 1st 4 month but can occur anytime in the 1st year
 - Presentation
 - Similar to major depressive disorder
 - Depressed mood, tearfulness, insomnia, fatigue, suicidal thought, prominent anxiety ,obsessions about child

■ Management

- Exclude medical cause (anemia , thyroid dysfunction)
- For mild to moderate –psychotherapy
- Pharmacologic therapy
 - Severe to moderate symptom
 - Non respond to non pharmacologic treatment
 - Antidepressant with adjuvant anxiolytic
 - SSRI (Fluoxetine 10-60 mg /day
 - TCAs (nortriptyline 50-150 mg/day)

- Postpartum psychosis
 - High risk
 - History of bipolar disorder or previous history of postpartum psychosis
 - Presentation
 - Dramatic onset in 48-72 hr after delivery (1st 2 wks)
 - Restlessness, insomnia, irritability, elated mood, delusional belief on baby and hallucination
 - Rate of infanticide is high about 4%
 - Management
 - Psychiatric emergency
 - Mood stabilizer (lithium, valporic acid, carbamazepine)
 - Electroconvulsive therapy – safe and rapidly effective

PTSD

- When woman confronted with circumstances (pain, loss, trauma)
- May lead to behavioral sequelae like flashbacks, avoidance, and inability to function
- Lead to fear of a subsequent delivery

THANK
YOU !