Objectives

* Discuss pharmacists’ role in patient education during and after pregnancy
* Treatment and monitoring of common comorbidities during pregnancy
* Discuss medications that affect oral health in pregnancy
Mr. Beau
Perinatal Care

- Perinatal – time period prior to birth through after delivery
- Care of mother and fetus or newborn
- Approximately 22\textsuperscript{nd} week of gestation through 1 week after birth (WHO definition)
- Perinatal health and maternal health are closely linked
290,000 women died due to complications in pregnancy and childbirth

- Millennial Development Goal: 75% reduction in maternal mortality from 1990 to 2015
  - Currently, progress is too slow
  - Investing in healthcare system training is key to success

- Developed countries: 16 deaths / 100,000 births
- Developing countries: 230 deaths / 100,000 births
Risk factors in maternal health

* Access to quality care
* Rural areas
* Low income areas
* Less educated areas
* Lack of trained healthcare providers

* Insufficient number of visits to healthcare providers
  * Missed comorbidity diagnoses
  * Missed immunizations
  * Missed treatments to newborns
Causes of maternal mortality

- Hemorrhage
- High blood pressure
- Infection
- Unsafe abortion
- Obstructed labor (6%)
  - Fistula: hole in birth canal that causes incontinence, kidney problems, and death. 80–95% cure rate with surgery.
Causes of newborn mortality

10,000 preventable newborn deaths occur daily. 90% in developing countries.

* Smoke and toxins released from mother cooking
* Smoking in mother
* Overweight/Obesity in mother
* Older age at delivery
* Placental Dysfunction Disorders
  * Pre-eclampsia, fetal growth restriction, placental abruption
* Maternal comorbidities: type 2 diabetes mellitus,
Continuum of Care: Prenatal / Preconception

* Folic acid supplementation
  * Decreased neural tube defects
* Malaria treatment and / or prevention
* Syphilis detection and treatment
* Tetanus immunization
* Detection and treatment of diabetes mellitus, hypertension, fetal growth restriction, induction past 41 weeks gestation
* Increased community awareness of services and treatments
Continuum of Care: Delivery and Postnatal

- Skilled care and emergency obstetric care
- Antibiotics for premature rupture of membranes
- Corticosteroids for preterm labor
- Active management for third stage of labor
- Neonatal resuscitation
Healthcare Provider Roles

* OB/ GYN MDs
* NP/ PA
* Dental care
* Pharmacists
* Nurses
* Midwives
Pharmacists’ Roles

* Preconception
  * Folic acid supplementation
  * Prenatal vitamin selection
  * Insurance issues
  * Patient education of comorbidities and treatment options

* Pregnancy
  * Over-the-counter medication questions
  * Prescription medication questions
  * Patient education on medication and healthy lifestyle choices
Pharmacists’ Roles

* Postpartum
  * Newborn and infant treatment and education
  * Breastfeeding patient education
  * Vitamin and supplement selection for mother and newborn
  * Special dietary needs of newborn and formula selection
  * Insurance issues
Pharmacists’ Roles
Patient education

* Preconception questions:
  * Safe medication use for comorbidities
  * Family planning and fertility treatments
  * Pregnancy test education
  * Vitamin and supplement education
Pharmacists’ Roles
Drug Metabolism in Pregnancy

* Cardiovascular: Increased heart rate, decreased albumin
* Respiratory: Decrease in lung capacity
* Renal: Increase in blood flow and filtration rate
* GI: Delayed gastric emptying, increased nausea & vomiting
Pharmacists’ Roles
Drug Metabolism in Pregnancy

- Hematologic: Increase in WBC & RBC, increase in clotting factors; increase in plasma volume
- Endocrine: Increased thyroid hormone production
Drug Metabolism in Breastfeeding

* Many mothers stop breastfeeding due to fear of medication transfer to infant
* Lipid soluble drugs are more likely to be in milk
* Breastfeeding schedule and peak drug levels in milk
* Volume of drug distribution in breast milk
  * Drugs that are widely distributed in body will be concentrated less in milk
* Protein binding (albumin) of drug
  * More protein binding decreases milk exposure
* Molecular weight of drug
  * Smaller molecules are more easily passed through cells
Drug Metabolism in Breastfeeding

InfantRisk Center:

www.infantrisk.org
Texas Tech University Health Sciences Center
Lab studies of medications in breastfeeding and pregnancy

www.medsmilk.com for medication use in breastfeeding updates
Comorbidities and pregnancy
Comorbidities and Pregnancy

- Diabetes
- HIV/AIDS
- Herpes Simplex virus
- Hepatitis B
- Bacterial infection
- Oral Candidiasis
- Seizures
- Mental illness
- Cardiovascular disease
- Asthma
* Category A: No risk to fetus demonstrated in first trimester
* Category B:
  * Animal studies do not indicate risk to fetus and no controlled studies in pregnant women
  * Animal studies have shown fetal risk, but controlled studies in pregnant women have not shown fetal risk
* Category C:
  * Animal studies show fetal risk and no controlled studies in women
  * No available studies in women or animals
* Category D:
  * Positive evidence of fetal risk, but benefit may outweigh risk
* Category X: known teratogen; contraindicated.
Diabetes:
* Insulin is no longer the only option, but it is preferred
* Glyburide, Metformin: effective and no fetal harm

HIV / AIDS
* Risk vs benefit of treatment during pregnancy and labor to decrease fetal exposure of virus
* Begin treatment with low CD4 counts or symptoms; otherwise, wait until second trimester
* Breastfeeding NOT recommended if formula available
Comorbidities and Pregnancy: Treatment

* Herpes Simplex Virus:
  * Acyclovir is preferred

* Hepatitis B:
  * Hepatitis B Immunoglobulin administered to mother and infant
  * Hepatitis C has no treatment to decrease transmission to infant

* Bacterial Infection:
  * Pregnancy: Penicillin (B), amoxicillin (B), cephalexin (B), azithromycin (B), metronidazole (B), clindamycin (B)
Comorbidities and Pregnancy: Treatment

* Oral Candidiasis:
  * Pregnancy: Nystatin (C) is considered the safest
  * Breastfeeding: Typically treat infant with nystatin, fluconazole, or gentian violet

* Vaginal Yeast Infection:
  * Pregnancy: Topical antifungal agents are safest: miconazole, clotrimazole

* Seizures:
  * Pregnancy: medication withdrawal if seizure-free for 2 years; phenobarbital is preferred over phenytoin, but both are category D. Gabapentin and topiramate are category C.
Case 1 – Angie

24 y/o female patient, allergy to penicillin
Called over the weekend about a sore tooth and wants to also discuss teeth whitening
Mentions she may be pregnant, but she’s not sure yet
Turns out, she has a mild tooth infection… How can we treat her infection? How can we treat her pain?
Oh, and antibiotics ‘like, always give me a yeast
Mental Illness:
* Depression
  * Pregnancy: Risk vs benefit; sertraline preferred
  * Breastfeeding: Paroxetine, sertraline, & nortriptyline have lowest detection levels in infants

ADD/ ADHD
* Amphetamines are contraindicated in breastfeeding

Anxiety: buspirone (B) is preferred in pregnancy, but not breastfeeding

Addiction/ substance abuse
* Pregnancy: nicotine replacement therapy, methadone (C), Subutex (Buprenorphine C)
Comorbidities and Pregnancy: Treatment

* Cardiovascular Disease
  * Hypertension
    * Pregnancy: Methyldopa is preferred; clonidine and hydralazine have been used
    * Breastfeeding: ACE-I, calcium channel blocker
  * Arrhythmia
    * Pregnancy: Atenolol, labetalol, and metoprolol in second and third trimesters is preferred
    * Warfarin is contraindicated in pregnancy
    * Breastfeeding: labetalol, propranolol, and metoprolol are preferred
    * Amiodarone is contraindicated in breastfeeding
Asthma:

* **B2-agonists:** albuterol inhalation preferred in second and third trimesters; compatible with breastfeeding
* **Theophylline:** no congenital defects but some adverse effects; ER formulation preferred in breastfeeding
* **Steroids:** Some reports of congenital effects in pregnancy with prednisone and beclomethasone
Pain:

- Pregnancy: Lidocaine (B), acetaminophen (B), oxycodone (B)
- Breastfeeding: Ibuprofen
Medications that affect oral health in pregnancy
Comorbidity treatment and oral health

* Asthma – typically inhalation steroids are avoided in pregnancy; albuterol is preferred for immediate relief
* Seizures – some cases of craniofacial malformations with phenytoin & carbamazepine; valproic acid can cause cleft palate in 1–2% of cases
* Depression – nortriptyline can cause anticholinergic effects such as dry mouth
Pharmacists’ Roles: Vitamins and Supplements

- Folic Acid: 0.4mg to 0.8mg recommended for women of child-bearing age
  - Decrease incidence of spina bifida & anencephaly
- Prenatal vitamins
  - Omega 3 fatty acids EPA and DHA support heart, immunity, brain, eyes, and CNS
  - Calcium: 1000mg / day in pregnancy & breastfeeding
Pharmacists’ Roles: Vitamins and Supplements

* Oral health: brushing and flossing
* Lifestyle changes: avoid sugary foods, eat nutritious snacks and meals, light exercise
Pharmacists’ Roles

* Immunizations
  * Flu
  * TdAP
Pharmacists’ Roles: Post Partum

‘The most accessible healthcare professional’

* What is safe and effective?
* Newborn and infant treatment for over-the-counter remedies
* Medication review of prescriptions
* Patient education on treatment duration, side effects, and treatment expectation
Pharmacists’ Roles: Newborn and Infant Care

* Diaper rash
* Nutritional supplement
* Vitamin supplement
  * Vitamin D 400 iu / day in breastfeeding to help calcium and phosphorus absorption
* Teething
* Fever
* Vomiting/ diarrhea
Case 2 – Alvin

* 26 y/o male, severe lack of sleep, but excited new dad
* Drops off wife’s discharge prescription at pharmacy
* Wants ‘to know what you recommend to have on hand for a new baby’
Pharmacists’ Role: Breastfeeding

* Thrush/ Yeast infection
* Cracked/ sore nipple treatment
* Cough and cold treatment
* Allergies
* Pain / inflammation
* Vitamin supplementation
  * Calcium
Other medication issues

* Insurance / affordability
* Formula selection
Comprehensive care of perinatal patients require gives the best outcomes for mother and child.
QUESTIONS??

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