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Preconception Care

Objectives:

- Describe how certain medical conditions affect pregnancy
- Describe how pregnancy affects certain medical conditions
- Assess a patient's genetic risk as well as father's genetic risk with regard to pregnancy
- Describe genetic screening options in pregnancy
- Recognize a patient's risk of substance abuse and intimate partner violence and explain how this would be addressed with a patient
- Appraise a patient's nutritional status and make recommendations to the patient on nutrition and exercise
- Assess a patient's medications, immunizations and environmental hazards in pregnancy
- Identify appropriate folic acid intake
- Identify ethical issues associated with prenatal genetic screening and diagnostic tests

References : 433 team, kaplan, Hacker & moore

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- **Obesity has become a world-wide problem** associated with metabolic dysregulation and must be addressed before pregnancy if outcomes are to be improved.
- **Preconception care should be started, especially in high-risk women (e.g., women with obesity (≥30), DM, or HTN), 6 months to 1 year before conception is attempted.**
- **Several models of preconception care have been developed.** According to one model, the major components of preconception care: 12 risk assessments and 6 health promotions

Major Components of Preconception Care	Risk Assessment
Reproductive life plan	Ask your patient: - If she plans to have any (more) children - how long she plans to wait until she (next) becomes pregnant and Help her develop a plan to achieve those goals
Past reproductive history	Review prior adverse pregnancy outcomes: - Fetal loss - Birth defects : women who have had an infant with a neural tube defect "high risk women" should take vitamins plus **4 mg of folic acid daily before conception**. High risk women : previous Hx of Neural tube defects or if she is on anti-epileptics or obese - Low birthweight - Preterm birth - Assess ongoing biobehavioral risks
Past medical history	Ask about: - Rheumatic heart disease - Thromboembolism - Autoimmune diseases Screen for (chronic diseases): - Diabetes and Hypertension
Infections and immunizations	Screen for: - Periodontal (surrounding a tooth) infections - Urogenital infections and STDs Discuss: ToRCHeS infections: Toxoplasmosis (management: avoid exposure to pets), Rubella, CMV, and Herpes, Syphilis, varicella-zoster, parvovirus B19). These infections can cause congenital anomalies (so you should discuss and tell the patient what may happen and tell her the preventive measure that you both are going to do) Update immunization for: - Hepatitis B - Rubella - Varicella - Tdap (combined tetanus, diphtheria and pertussis) - Human papillomavirus - Influenza vaccines as needed

<table>
<tr><td>Medications</td><td>Avoid category X drugs and most category D drugs unless potential maternal benefits outweigh fetal risks, Review use of over-the-counedications, herbs and supplements. [FDA drug risk classification]</td></tr>
<tr><td>Genetic screening and family history</td><td>Assess risk of chromosomal or genetic disorders based on:
- Family history
- Ethnic background :
SELECTED AUTOSOMAL RECESSIVE DISEASES IN DEFINED ETHNIC GROUPS
<table><tr><th>Disease</th><th>Ethnic Group</th><th>Carrier Frequency</th></tr><tr><td>Sickle cell disease</td><td>Blacks</td><td>1/10</td></tr><tr><td>Cystic fibrosis</td><td>Whites</td><td>1/25</td></tr><tr><td>Tay-Sachs disease</td><td>Jews, French Canadians</td><td>1/30</td></tr><tr><td>Thalassemia</td><td>Mediterraneans, Southeast Asians</td><td>1/25</td></tr></table>- Age : Women older than 34 years are at increased risk of giving birth to children with autosomal trisomies or sex chromosomal abnormalities
- Offer cystic fibrosis screening
- Discuss management of known genetic disorders before and during pregnancy.</td></tr>
<tr><td>Nutritional assessment</td><td>Assess:
- Body mass index (normal 19-25)
- Biochemical (e.g., anemia)
- Dietary risks</td></tr>
<tr><td>Substance abuse</td><td>Ask about:
- Smoking
- Alcohol
- Drug use
Use CAGE questionnaire to screen</td></tr>
<tr><td>Toxins and teratogens</td><td>Review exposures at home, neighborhood, and work</td></tr>
<tr><td>Psychosocial concerns (unplanned pregnancy is risk factor for psychological issues)</td><td>Screen for:
- Depression
- Anxiety
- Intimate-partner violence
- Major psychosocial stressors</td></tr>
</table>

Physical examination	Focus on: - Periodontal - Thyroid - Heart - Breasts - pelvic examination
Laboratory tests	- CBC (for **anemia**, or low iron or blood count) - Urinalysis - Thyroid-stimulating hormone - Blood type and antibody screen: If a woman is Rh-negative and her partner is Rh-positive, then her baby has a chance of being Rh-positive. In these cases, the woman can develop antibodies to the baby's blood. These antibodies can lead to complications of pregnancy in future pregnancies (not the first pregnancy), such as pregnancy loss or growth restriction. - Rubella, syphilis, hepatitis B, HIV, cervical cytology, gonorrhea, chlamydia, diabetes
Major Components of Preconception Care	**Health Promotion**
Family planning	Promote family planning based on a woman's reproductive life plan. For women who are not planning on getting pregnant —(then)→ promote effective contraceptive use and discuss emergency contraception.
Healthy weight and nutrition	● Discuss macro- and micronutrients including 5-a-day and daily intake of multivitamin containing folic acid (0.4 mg per day) ● Promote healthy prepregnancy weight through exercise and nutrition
Health behaviors	Promote: 1- Nutrition and exercise 2- safe sex 3- effective use of contraception 4- dental flossing (remove food and dental plaque from between teeth) 5- use of preventive health services Discourage: 1- douching, 2- non-seatbelt use 3- smoking, 4- alcohol 5- substance abuse
Healthy environments	Discuss household, neighborhood, and occupational exposures to metals, organic solvents, pesticides, endocrine disruptors, and allergens

Stress resilience	the process of adapting well in the face of sources of **stress** 1- nutrition, exercise, sleep, and relaxation techniques 2- identify resources to help your patient develop problem-solving and conflict resolution skills
Interconception care	Promote breastfeeding, back-to-sleep, positive parenting behaviors, and reduce ongoing biobehavioral risks.

How certain medical conditions affect pregnancy?

Example: DM, The relationship between the hemoglobin A1C level and fetal malformation risk:

Hg A1c	fetal malformation risk
<7	**Baseline**
7.2-9.1	**14%**
9.2-11.1	**23%**
>11.2	**25%**

Diabetic related fetal malformation:

1- CVS

2- CNS

3- Gastric and genitourinary

4- Skeleton

The relationship between the hemoglobin A1C level and miscarriage rate:

If Hg A1c level = 11 ⟶ 44% miscarriage rate

Remember: the organ formation occurred at 3-10-week EGA (Estimated Gestational Age)

. How pregnancy affects certain medical conditions?

Example: SLE, DM, Hypertension

1- SLE:

Pregnancy should occur during disease quiescence (inactivity).

⟶ for less 6 months EGA:

If disease activate during pregnancy à adverse maternal and obstetrical complication ⟶ All SLE medication should be reviewed

Goal: maintain disease control with maximizing safety profile

2- DM:

Can lead to organ damage, that lead to Life-threatening:

1. Diabetic nephropathy
2. Diabetic retinopathy
3. Hypertension

Rising levels of human placental lactogen, progesterone, prolactin, and cortisol in pregnancy are some of the primary factors associated with progressive **insulin resistance** during pregnancy.

★ Decreased Perinatal mortality due to the ability to control glucose level by insulin and hyperglycemic agent

3- HTN:

- **Classification:**
  Normal <140/90
  Mild to moderate 140-159/90-109 ® NO benefit of treat it
  Severe >160/90 ® must treat it
- **Treatment:**
  Methyldopa, labetalol (beta blocker)
- **Contraindication**:
  ACE inhibitors, angiotensin II receptor blockers (ARB), direct renin inhibitors
- **Pregnancy risk:**
  1- Superimposed preeclampsia
  2- Placental abruption
  3- Fetal growth restriction

Case

You have been Mary's doctor for the past 3 years. She is a 39-year-old Caucasian woman with a BMI of 32.9 who sees you primarily for her idiopathic chronic hypertension, which is well controlled on an ACE inhibitor. She has smoked 1 pack of cigarettes per day for the past 20 years. She is in today for her annual exam and mentions that she is getting married in a few months and would like to start a family. She has never been pregnant before.
On physical exam, her BP=138/84, Ht=5' 2", Wt=180 lbs. Otherwise, her exam is unremarkable.

Questions

- **What is the goal of counseling a woman about pregnancy prior to conception?**

This type of counseling is often referred to as preconception care or counseling. The goal is to optimize, whenever possible, a woman's health and knowledge before planning and conceiving a pregnancy in order to eliminate, or at least reduce, the risk associated with pregnancy for the woman and her future baby. In addition, if pregnancy is not desired, then current contraceptive use and options can be discussed to assist the patient in identifying the most appropriate method for her and to reduce the potential for an unplanned pregnancy.

- **What are the major topics that should be discussed or addressed with any woman prior to conception?**

• Identify undiagnosed, untreated or poorly controlled medical conditions
• Review immunization history and recommend appropriate immunizations
• Risks of medication and radiation exposure in early pregnancy
• Nutritional issues
• Family history and genetic history including racial/ethnic background and specific genetic risks
• Tobacco, alcohol, and substance abuse and other high-risk behaviors (such as sexual activity and risk for STIs)
• Occupational and environmental exposures
• Social issues
• Mental health issues
• Screening for intimate partner violence issues

A provider who is skilled in the care of obstetric patients may perform counseling. However, the assistance of a maternal-fetal medicine specialist or genetic specialist may be necessary in certain circumstances.

- **For the patient in this case, what specific topics need to be addressed?**

Mary will need to be counseled regarding several preconception issues, including:
• Weight loss and exercise:

Mary's BMI is 32.9 and she is obese [BMI $\geq$ 30]; weight loss in obese non-pregnant women has proven health benefits: for Mary, she may see improvement in her blood pressure and decrease the need for antihypertensive therapy; obesity in pregnancy is associated with increased risks including higher rates of gestational diabetes, preeclampsia, cesarean delivery, anesthesia complications, post-operative complications)

• The effect of chronic medical disease (idiopathic hypertension) on pregnancy (increased risk of preeclampsia, fetal growth restriction, abruption and recommendations for heightened maternal and fetal surveillance in pregnancy)
• Need to modify antihypertensive therapy. ACE inhibitors are contraindicated in pregnancy due to risks for fetal renal dysgenesis and dysfunction
• Effect of smoking on pregnancy (increased risk of fetal growth restriction)

Offer Cystic Fibrosis (CF) carrier testing (carrier prevalence increased in Caucasians) and discuss any family history of birth defects or genetic disorders: referral for genetic counseling may be warranted if issues are identified

• Discussion of increased risk of Down's Syndrome and other trisomies based on current age of 39 and probable older age when she conceives. Screening options may include cell free fetal DNA, nuchal translucency and first trimester screening, quadruple screen and integrated/sequential techniques
• Begin prenatal multivitamins or at least folic acid supplementation (0.4 mg per day) for the prevention of fetal neural tube defects and 4 mg/day if they have had a prior child/pregnancy with a neural tube defect
• Accurate recording of LMP and cycle length in order to assist in dating her pregnancy and allow her to present early for prenatal care when she does conceive.
• Review immunization history; employment, medical or behavioral risk factors for infections against which effective vaccines are available; and test for evidence of immunity against rubella: recommended immunizations based on your review