437 Team: Obstetrics and Gynecology

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:

- Kaplan USMLE step 2 CK - Obstetrics and Gynecology
- Online Meded videos
- Team 435

Team members: Meaad AlNofaie, Noura AlBassam, Ghada Alqarni
Team leader: Ahad AlGrain .
Revised by: Sondos Alhawamdeh

Color index: Important | Notes | Meded | Video-Case

Editing file link

Overview :

- The growing recognition of the limits of prenatal care and the importance of women's health before pregnancy has drawn increasing attention to preconception care.
- As defined by the U.S. Centers for Disease Control and Prevention, **preconception care is a set of interventions that aim to identify and modify biomedical, behavioral, and social risks to a woman's health or pregnancy outcome through prevention and management.**
- Several models of preconception care have been developed.
- Major components of preconception care **include :**
  1- risk assessment.
  2-health promotion.
  3- medical and psychosocial interventions
  4-follow-up.

-If a woman is pregnant the first evaluation should happen at the 10th week and in this evaluation you should start screening.

- **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:**

-Preconceptions counselling for planned pregnancy do better than unplanned.
-When planning a pregnancy we can focus on the safety of pregnancy for genetic risk and maternal age, advanced maternal age can increase the risk for fetus loss, in those cases the pregnancy should be handled as a high risk pregnancy.

ELEMENTS OF PRECONCEPTION COUNSELING AND CARE

Major Components of Preconception Care	Risk Assessment
Reproductive life plan	ask your patient if she plans to have any (more) children and how long she plans to wait until she (next) becomes pregnant. help her develop a plan to achieve those goals.
Past reproductive history	Review prior adverse pregnancy outcomes, such as fetal loss, birth defects(EX:NTDs; give high risk pts"Hx of NTDs or on antiepileptic drugs"4 mg of folic acid daily before conception) , low birth weight, and preterm birth, and assess ongoing biobehavioral risks that could lead to recurrence in a subsequent pregnancy.
Past medical history	ask about past medical history such as rheumatic heart disease, thromboembolism, or autoimmune diseases that could affect future pregnancy. screen for ongoing chronic conditions such as hypertension and diabetes.
Medications	Review current medication use. avoid category X drugs and most category D drugs unless potential maternal benefits outweigh fetal risks (see box 7-1). Review use of over-the-counter medications, herbs, and supplements.
Infections and immunization Q)In counseling; if she is not immune against rubella and : - **Not preg**. : give her vaccine. But she can't get pregnant for 3 months after it ? Prevent Congenital rubella syndrome (CRS) **-pregnant** : <u>After delivery</u> (vaccinate + ocp for 3 months)	screen for periodontal, urogenital, and sexually transmitted infections as indicated. Discuss ToRch (toxoplasmosis [1], other, rubella, cytomegalovirus, and herpes) infections and update immunization for hepatitis b, rubella, varicella, Tdap (combined tetanus, diphtheria, and pertussis), human papillomavirus, and influenza vaccines as needed. Vaccines mom should be uptudate with flu, hepatitis B, and MMRV (measles, mumps, rubella, and varicella). MMRV is a live attenuated vaccine that can't be given at pregnancy, it can cause birth defects and induce viremia. You can give a pregnant woman the flu shot intramuscular, but not nasal spray vaccine because it's a live attenuated vaccine. Hepatitis B vaccine should be given prior to the pregnancy but it can be given while pregnant.
Genetic screening and family history CYSTIC FIBROSIS: genetic screening 1- Preimplantation genetic diagnosis (IVF). 2- Chorionic villus sampling -1st trimester (12-13w). 3- Amniocentesis- 2nd trimester	assess risk for chromosomal or genetic disorders based on family history, ethnic background, and age. offer cystic fibrosis screening. Discuss management of known genetic disorders (e.g., phenylketonuria, thrombophilia) before and during pregnancy.
Nutritional assessment	assess anthropometric (body mass index), biochemical (e.g., anemia), clinical, and dietary risks. Prescriptions of prenatal vitamins and folic acid, folic acid can prevent neural tube defects. The most important thing to know is that the fetus is most vulnerable at early stages of development, planning pregnancy can help in avoiding toxins and things that are unhealthy for the baby early at its most crucial times.

SELECTED AUTOSOMAL RECESSIVE DISEASES IN DEFINED ETHNIC GROUPS

Disease	Ethnic Group	Carrier Frequency
Sickle cell disease	Blacks	1/10
Cystic fibrosis	Whites	1/25
Tay-Sachs disease	Jews, French Canadians	1/30
Thalassemia	Mediterraneans, Southeast Asians	1/25

1- Protozoal infection.causes : hydrocephalus, microcephaly, intracranial calcifications

Substance abuse	ask about smoking, alcohol, drug use. use T-ace (tolerance, annoyed, cut down, eye opener) or caGe (cut-down, annoyed, guilty, eye-opener) questions to screen for alcohol and substance abuse. Smoking, alcohol and illicit drug cessation because of its teratogenic effect.
Toxins and teratogens	Review exposures at home, neighborhood, and work. Review Material safety Data sheet and consult local Teratogen information service as needed.
Psychosocial concerns	screen for depression, anxiety, intimate-partner violence, and major psychosocial stressors. screening for domestic violence and abuse (physically and mentally)
Physical examination	Focus on periodontal, thyroid, heart, breasts, and pelvic examination.
Laboratory tests	check complete blood count, urinalysis, type and screen, rubella And , syphilis,hepatitis b, hiv, cervical cytology; screen for gonorrhea, chlamydia, and diabetes in selected populations. consider thyroid-stimulating hormone.

Major components of precondition 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, promote effective contraceptive use and discuss emergency contraception.
Healthy weight and nutrition	Promote healthy pre pregnancy weight through exercise and nutrition. Discuss macronutrients and micronutrients, including 5-a-day and daily intake of multivitamin containing folic acid.
Health behavior	Promote such health behaviors as nutrition, exercise, safe sex, effective use of contraception, dental flossing, and use of preventive health services. Discourage risk behaviors such as douching, nonuse of seat belt, smoking, and alcohol and substance abuse.
Stress resilience	Promote healthy nutrition, exercise, sleep, and relaxation techniques; address ongoing stressors such as intimate partner violence; identify resources to help patient develop problem-solving and conflict resolution skills, positive mental health, and relational resilience.
Health environment	Discuss household, neighborhood, and occupational exposures to metals, organic solvents, pesticides, endocrine disruptors, and allergens. Give practical tips such as how to reduce exposures during commuting or picking up dry cleaning.
Interconception	Promote breastfeeding, back-to-sleep, positive parenting behaviors, Interconception care and reduce ongoing biobehavioral risks.

How certain medical conditions affect pregnancy?

<u>Example:</u> DM, The relationship between the hemoglobin A1C level and fetal malformation risk:

HgA1c	fetal malformation risk
<7	baseline
7.2-9.1	14%
9.2-11.1	23%
>11.2	25

Diabetic related fetal malformation:
1- CVS: ASD, VSD the most common
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)
Q) can GDM cause anomalies ? No ; it develops in the 2nd trimester. DM T1+T2 can lead to anomalies

Optimization of diseases focuses mostly on DM, HTN and hypothyroidism the reason for this is that medication we use to treat this disease are teratogenic specially HTN so the goal is to achieve adequate control and get them off the medications they are usually on in order to prepare them to manage the disease while pregnant
Dm and HTN medications can cause teratogenic effects.
Hypothyroidism because of physiological changes in pregnancy you need to increase the dose.

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 an 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 hypoglycemic 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[1]
  2- Placental abruption
  3- Fetal growth restriction
  4- Intrauterine fetal death

1- State of generalized vasospasm (heart,kidney,brain)

Video 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.

In the OSCE you will have a scenario(like the discussed case)and you will be ask to council the pt "use every single information given" DM ,HTN , smoker,OCP.

- OCP counselling, how to council for combined contraceptive, note that if the pt wants OCP and she is a smoker and :

Over 35 : absolute contraindication
Below 35: relative contraindication
If she over 35 and not smoker : relative contraindication

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.

Some diseases # pregnancy :ex: Pulmonary HTN >50% mortality rate. So what to do ? Advise them not to get preg.and prescribe OCP

•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 ≥ 30]; weight loss in obese non-pregnant women has proven health benefits. Mary,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(wound infection), anesthesia complications, post-operative complications(thrombosis))

• **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) -> + DVT (Polycythemia vera ' vascular stasis' +endothelial injury)

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 (From Maternal blood), nuchal translucency(11-13 w) 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