FOGSI GCPR
ON
Preconception Care & Genetics

Editors

Dr Alpesh Gandhi | Dr Mandakini Pradhan | Dr. Atul Ganatra

Version 01| 27th September, 2020

FOGSI GCPR
ON
Preconception Care & Genetics

Editors:

Dr Alpesh Gandhi

Prof Mandakini Pradhan

Dr Atul Ganatra

Coordinators:

Dr Archana Baseru **Dr Mandakini Megh** **Dr. Ameya Purandare**

Contributors:

Dr Archana Baser
Dr Atul Ganatra
Dr Aswath Kumar
Dr Firoz Bhuvar
Dr Hema Purandare
Dr Janak Desai
Dr Jayprakash Shah
Dr Mandakini Megh
Dr Nikhil Datar
Dr Pragya Mishra
Dr Prashant Acharya
Dr Priti Vyas
Dr Raju R Sahetya
Dr Saurabh Dani
Dr Sunil Shah

INDEX

A. GOAL:

The goal of pre-pregnancy care is to reduce the risk of adverse health effects for the woman, fetus, and neonate by working with the couple to optimize health, address modifiable risk factors, and provide education about healthy pregnancy.

B. TIMING OF PRE-PREGNANCY COUNSELING:

Any non-pregnant women with reproductive potential whether she is currently using contraception or planning pregnancy is eligible for pre pregnancy counseling.

Because health status and risk factors can change over time, pre-pregnancy counseling may occur several times during a woman's reproductive lifespan, increasing her opportunity for education and potentially maximizing her reproductive and pregnancy outcomes.

Women should be counseled to seek medical care before attempting to become pregnant or as soon as they believe they are pregnant to aid in correct dating and to be monitored for any medical conditions in which treatment should be modified during pregnancy.

C. PERSONNEL DOING PRE-PREGNANCY COUNSELING:

Pre-pregnancy counseling can be performed by the obstetrician-gynecologist. and registered medical practitioner taking care of pregnant women.

D. STEPS:

1. Review of Medical, Surgical, and Psychiatric Histories:

History of any chronic illness and it's medications intake are to be noted. Absence of common diseases like diabetes, hypertension, thyroid disease, tuberculosis and mental health are to be given emphasis. Surgical procedures both open and endoscopic procedures to be noted. Any surgery on the uterus and bariatric surgery can be asked specifically.

2. Review of Current Medications:

All prescription and alternative therapy medications should be reviewed during pre-pregnancy counseling. This review also should include nutritional supplements and herbal products that patients may not consider to be medication use but could affect reproduction and pregnancy outcome.

3. Review of Family History and drawing pedigree:

Ask about birth and genetic defects in the family, psychiatric disorders, cancers especially breast, ovarian and colon cancer, diabetes, heart diseases and autism.

One tool for family history collection and charting is Pedigree charting (Annexure I). A pedigree represents biological relationships using standardized symbols. It is usually taken in person, should ideally involve 3 generations. It must include ages of all individuals, age at death and cause of death of deceased individuals, relevant medical history; any history of infertility, recurrent pregnancy losses, infant deaths and stillbirths. It is important to ask about health status of first-degree relatives (parents, siblings, offsring), second-degree relatives (uncles, aunts, nephews, nieces and grandparents) and third-degree relatives (first cousins). History from both partners is essential.

In case a three generations pedigree charting is not possible, at least the following needs to be mentioned:

- ✓ Consanguinity
- ✓ Family history of Birth or Genetic Defects
- ✓ Health Problems like recurrent blood transfusion, recurrent malformation etc
- ✓ Genetic defects of adult origin like neurological defect

4. Immunizations history:

Women of reproductive age should have their immunization status assessed for tetanus toxoid, acellular pertussis (Tdap); measles-mumps-rubella; hepatitis B; and history of varicella or vaccination.

All patients should receive an annual influenza vaccination; those women who are or will be pregnant during influenza season will have additional benefits.

5. Substance Use Assessment:

All patients should be routinely asked about their use of alcohol, nicotine products, and drugs, including prescription opioids and other medications used for nonmedical reasons.

6. Assess Nutritional Status

Patients should be screened regarding their diet and vitamin supplements to confirm they are meeting recommended daily allowances for calcium, iron, vitamin A, vitamin B12, vitamin B, vitamin D, and other nutrients.

Patients should be encouraged to try to attain a body mass index (BMI) in the normal range before attempting pregnancy; Abnormal high or low BMI is associated with infertility and maternal and fetal pregnancy complications.

Female pre-pregnancy folic acid supplementation should be encouraged to reduce the risk of neural tube defects (NTDs).

WHO-Asian BMI classification

Nutritional status	Asia-Pacific	WHO
Underweight	Less than 18.5	18.5
Normal	18.5-22.9	18.5-24.9
Overweight	23-24.9	25-29.9
Obese I	25-29.9	More than 30
Obese II	More than 30	

BMI= 19-23 (Normal)
Optimise weight especially Obese I and II

7. Family Planning and Pregnancy Spacing:
The women should be asked about method of contraceptive use, number of medical termination of pregnancy and it's cause and treatment taken to conceive in the past.

8. Domestic violence:
Specially Alcohol abuse or any other substance abuse causing domestic violence should be noted.

E. SPECIAL CASES:
HYPERTENSION

- Woman with known hypertension should be evaluated for renal disease, autoimmune disorders or thrombophilia
- Any complication such as ventricular hypertrophy and retinopathy have to be ruled out.
- ARBs (Candesartan, Eprosartan, Irbesartan, Losartan) and ACE inhibitors (Captopril, Enalapril, Lamipril, Fosinopril, Quinapril etc) are contraindicated in pregnancy and needs to be switched to another safe antihypertensive drug.

DIABETES MELLITUS

- History of IDDM/ JUVINILE/ Type II DM is to be asked for.
- Sugar control and self-monitoring: HbA1C should be less than 6.5% before planning pregnancy. Exercise, diabetic diet and medications to be continued even after pregnancy.

SEIZURE DISORDERS

- Anticonvulsants like valproate is known teratogens and to be switched to safer anticonvulsant after consulting neurologist or physician.

- Change to anticonvulsant monotherapy at the lowest effective dose to control seizures.
- At least 6 months of seizure free interval before planning pregnancy.
- Medicines to continue after diagnosis of pregnancy.
- And warned about hazards of self-withdrawal of medication without consulting the neurologist even if it has the potential risk of teratogenicity.

HEART DISEAESE

- Woman should avoid planning pregnancy should if there is dysponea at rest or with minimal work (NYHA Class III or IV). She should be referred to a cardiologist or a physician for evaluation of her cardiac condition and necessary corrective steps.
- She is advised to continue her penicillin prophylaxis if she is a case of rheumatic heart disease
- Previously cardiac valve operated patient on anticoagulant should be advised for teratogenicity of oral anticoagulant and hence need for reporting early in pregnancy. Frequent monitoring of efficacy of anticoagulation is to be informed
- Rule out congenital heart disease and counselling if needed

THYROID DISORDER:

- Hypothyroid affects 2.5%-5% of pregnant women. If uncontrolled, can cause anemia, recurrent pregnancy loss and even pregnancy induced hypertension. Easy and widely available tests like TSH can detect and medications can alter the pregnancy outcome.
- Hyperthyroidism prevalence in pregnancy is reported to be 0.2%. History of weight loss, palpitations and an increased pulse rate with low TSH may point towards the diagnosis. Rarely it is known to cause fetal tachycardia and hydrops. It's treated with Propylthiouracil in first trimester and Methimazole in second and third trimester. However, consultation of an endocrinologist or physician is preferred.

CANCERS

- Pregnancy outcome will depend on the type and stage of cancer and completion of therapy.
- Good pregnancy outcome following surgical removal and radioactive iodine therapy for cases of thyroid cancer.
- Young patients with cancer - Counselled about effects of cancer treatment on fertility and pregnancy outcomes and preservation methods like cryopreservation of sperm for an adult male, and embryo and oocyte for an adult female; depending on the age, type of cancer, and treatment of cancer.

AUTOIMMUNE DISEASES

- History of Rheumatoid arthritis and SLE - reviewed before and during pregnancy.
- Drugs like methotrexate, leflunomide and cyclophosphamide are teratogenic and pregnancy to be avoided.
  Risk of maternal and fetal complications during pregnancy, including spontaneous abortion and premature delivery, intrauterine growth retardation (IUGR), and superimposed pre-eclampsia and congenital heart block (if SSA and SSB or Ro, La antibodies present) is to be informed
- Need for continuation of drugs after pregnancy & pregnant antewatal check ups is to be emphasised

PSYCHITRIC ILLNESS

- Risk of relapse during pregnancy and the risk to the fetus from the potential teratogenicity of the antipsychotic drugs.

THROMBOEMBOLIC DISEASE

- If personal or family history of thrombotic events then screen them for hereditary and acquired thrombophilia (Antiphospholipid Antibody Syndrome).

FEMALE GENITAL MUTILATION (FGM)

- FGM involves the partial or total removal of external female genitalia or other injury to the female genital organs for non-medical reasons.
- The practice has no health benefits for girls and women.
- FGM can cause severe bleeding and problems urinating, and later cysts, infections, as well as complications in childbirth and increased risk of newborn deaths.
- FGM is mostly carried out on young girls between infancy and age 15. years
- FGM is a violation of the human rights of girls and women.
- WHO is opposed to all forms of FGM, and is opposed to health care providers performing FGM (medicalization of FGM).
- It should be asked and looked for during pre conception counselling.

SEXUALLY TRANSMITTED DISEASE:

- HIV, chlamydia, genital herpes, genital warts, gonorrhea, some forms of hepatitis, syphilis, and trichomoniasis are STDs
- If examination reveals inguinal lymphadenopathy, urethritis, cervicitis, painful ulcer; then detail investigation for STDs need to be done.
- Detection and preconception treatment can result in having better pregnancy outcome.

HAEMOGLOBINOPATHIES:

- Diseases like thalassemia major, Sickel cell disease and Sickel Beta thalassemia and HbE beta thalassemia result in transfusion dependant anemia in infants after 6 months of life.
- 3-17% is the carrier frequency of beta thalassemia in India which varies across various communities.
- When both husband and wife are carrier, there is 25% risk of fetus being affected with disease.
- Couple at risk of having this condition can be identified by MCV, MCH, Hb electrophoresis and Hb HPLC. Hb HPLC test is more accurate.
- Prenatal diagnosis can be done at 12 weeks of pregnancy by chorionic villous sampling and birth of such child can be prevented.

RECURRENT FETAL MALFORMATION

- Congenital malformation can affect 3-5% of pregnancy. There can be recurrent malformation which could be because of a part of genetic syndrome or due to single gene defect.
- Documentation of the defect detected on antenatal ultrasound, postnatal examination may help in delineating the genetic syndrome, recurrence risk and further testing of the couple and/or fetus.

F. EVALUATION IN PRE-PREGNANCY PERIOD : (Annexure II)

General physical examination and systemic examination
Pallor, Edema, Icterus, Breast and thyroid examination, Skin examination
Ht, Weight, BMI
Blood pressure, Pulse rate,
Systemic and Local Examination

G. INVESTIGATIONS:

Blood group (ABO and Rh),
CBC with indices, Hb HPLC/ Electrophoresis
Blood sugar (Fasting and post prandial)
TSH
Antiphospholipid antibodies (Lupus anticoagulant, anti-cardiolipin antibody(IgG and IgM), 2 glycoprotein) if recurrent pregnancy loss
Infectious Disease Screening:
VDRL, HIV, HBsAg
Rubella: IgG (if negative: for vaccination)

SCREENING FOR GENETIC DISORDER : on case to case basis

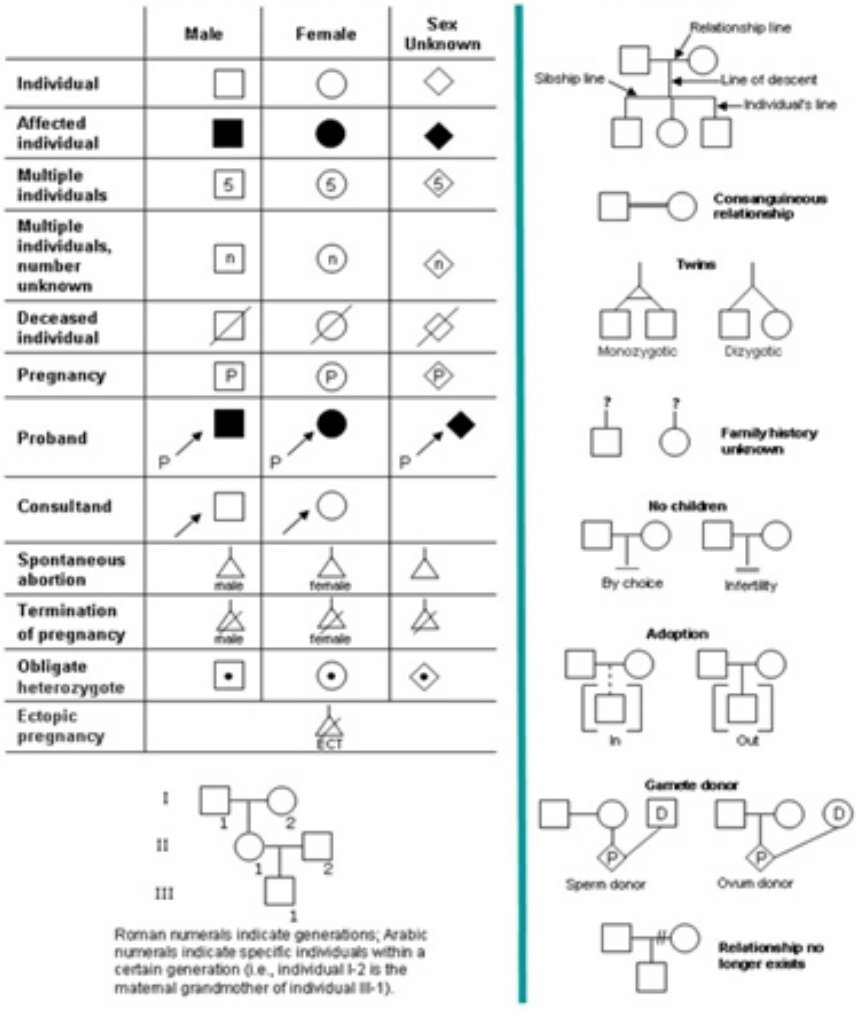
- Parentral karyotype: if recurrent spontaneous abortion, previous malformation (2 ml Blood sample to be sent in sterile heparinized vial)
- Mutation analysis for Cystic fibrosis and spinal muscular dystrophy: when neonatal death due to respiratory distress (2ml blood sample in EDTA vial)
- Mutation analysis for Congenital adrenal hyperplasia: if previous history of ambiguous genitalia (2ml blood sample in EDTA vial)
- Y microdeletion study: if male factor infertility with oligo-astheno-zospermia especially if abnormal morphological forms of sperm are seen. (2ml blood sample in EDTA vial)
- Microarray analysis: for unexplained still birth (fetal sample like 2 ml blood in EDTA or placental tissue in culture media obtained from the lab)
- Clinical exome sequencing: (2ml blood sample in EDTA vial)

✓ if previous unexplained developmental delay (preferable to test the previous child)

✓ Carrier screening for common genetic disorder after genetic counselling (not recommended routinely; may be as part of research)

Annexure I :

PEDIGREES



Annexure II

Name		Registration Number of patient or Adhar card number	
Age		Phone number	
Resident of		Referal Doctor	
Educational qualification		Occupation	
Diagnosis			

Sl No.	Criteria	Yes	No
Past Obstetric History	Recurrent abortion		
	Previous still birth If yes, cause (if known)		
Medical and Surgical history	Diabetes mellitus If Yes, control or not		
	Hypertension If yes, Medication		
	Tuberculosis If yes, Medication (complete or incomplete)		
	Any Pshychological disorder If yes, medicines		
	Surgery on utérus (myomectomy)		
	Any other		
	History of any surgery If yes, the site		
History of drug intake	If yes, Name Category (FDA)		

Personal History	Smoking		
	Alcohol		
	Any other substance abuse		
Genetic History	Consanguinity		
	Family history of blood transfusion in childhood		
	Previous neonatal death due to respiratory distress		
	Family history of known genetic disorder		
	Any other		
Vaccination History	Hepatitis B		
	Rubella or MMR		
	Others like (H1N1) etc		

References :

1. ACOG Committee Opinion Number 762, Vol 133, No 1, Jan 2019.

2. Joint SOGC-CCMG Clinical Practice Guideline, Journal of Obstetrics and Gynaecology Canada, Volume 39, Issue 9, September 2017, Pages 818-832