

Preconceptional Care for Chronic Medical Conditions

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Abstract

The goal of this article is to pay tribute to the Fetus who develops maternal bonding in intrauterine life. This bonding is healthier, secure and strengthened if preconception care is rendered to mother. Medical ethics demand that fetus is a patient, fetus has rights. Several of the medical conditions, personal behaviors, psychosocial risks and environmental exposures associated with negative outcomes can be identified and modified before conception through clinical interventions. For certain conditions, opportunities for preventive interventions occur only before conception. Preconceptional Care for chronic medical conditions is discussed.

Keywords: Preconceptional care; Fetus medical conditions; Interventions.

Introduction

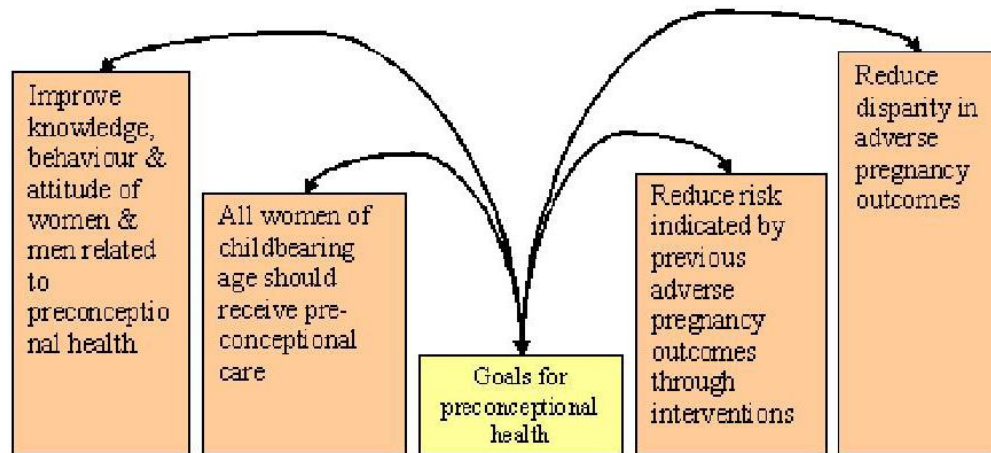
Successful motherhood is the unique achievement in a woman's life. Though it is a natural phenomenon, yet the way to achieve it may endanger the life of both mother as well as the fetus. Preconception, conception, pregnancy, birth and childbearing are in continuum. Earlier events affect the present and future. Therefore good antenatal care begins before pregnancy. Focus of obstetrical care has changed, from treating maternal and fetal diseases to predicting and preventing them.

Preconception care involves screening for conditions which may impact fertility, fetal development or mother's ability to adopt to pregnancy. Preconception care is a set of interventions that aim to identify and modify biomedical, behavioral and social risks of woman's health or pregnancy outcome through prevention and management.

Preconception care focuses on the potential medical genetic, gynaecological and psychosocial problems of a couple before conception. Preconception care leads to better

pregnancy outcome because preconception care interferes before the critical period of organogenesis. Usually prenatal counseling takes place after this critical period. In addition, with the application of preconception care there is a shift from acute care to counseling based preventive care, which might make preconception care cost effective. Several of the medical conditions, personal behaviors, psychosocial risks and environmental exposures associated with negative pregnancy outcomes can be identified and modified before conception through clinical interventions.

It is beyond the scope of this article to review all the conditions and factors amenable to preconception care. These will be highlighted in the next review series. In this article we explore the common medical conditions that are associated with adverse pregnancy outcomes for women and their offsprings. We also focus the degree to which specific preconception interventions and treatment can impact the effects of the condition on birth outcomes. Because avoiding, delaying or achieving optimum timing of a pregnancy is often an important component of Preconception care of women with medical

Figure 1: Goal of Preconceptional Health

conditions. We explore several interventions that, if implemented before pregnancy; can improve pregnancy outcomes for women and infants.

Strategies for Preconceptional Counseling

- Risk identification, reduction and elimination
- Health promotion
- Interventions or modifications to achieve optimal outcome
- Treatment and/or referral

- Ongoing education, counseling and support.

Chronic Medical Disorders

Because 40 to 50 % of pregnancies are unintended, family physician should consider the potential for pregnancy when writing each prescription.[1] All women of reproductive age, including those with disabilities should receive counseling about the potential effects of any medication they use on pregnancy related outcomes and about options to alter dosage or switch to safer medication prior to

Figure 2: Key Components of Preconceptional Care

conception. Consultation with a maternal & fetal medicine specialist may be beneficial in these circumstances.

Diabetes Mellitus

- Use contraception until excellent glucose control is achieved
- self–monitoring and balancing food intake, exercise and insulin
- Transition to insulin (type 2 diabetes) & pump
- Giving specific goals: Fasting glucose 60 to 100 mg per dL (3.3 to 5.6 mmol per L) & Two-hour postprandial glucose 100 to 120 mg per dL (5.6 to 6.7 mmol per L), HbA1C (glycosylated hemoglobin) within normal range.
- Identify, evaluate and treat: Hypertension, Nephropathy, Retinopathy, Thyroid disease, Hyperlipidemia
- Counseling on risks of pregnancy, requirement for increased visits and close monitoring.
- Relative contraindications to pregnancy: Blood urea nitrogen greater than 30 mg per dL (10.7 mmol per L), Creatinine clearance less than 30 mL per minute (0.5 mL per second), Coronary artery disease.[2]

Women with glycosylated hemoglobin [HbA1C] levels higher than 8.4% have shown to have a 32% rate of spontaneous abortion and a sevenfold increased risk of severe fetal anomalies compared with women who have good diabetes control.[2] Intensive diabetic management starting before conception decreases the risk of abortions and congenital anomalies apart from decreasing the complications of pregnancy. Insulin has long been the drug of choice for women with type 1 and type 2 diabetes mellitus during pregnancy. Promising results have been shown by Research on use of glyburide in patients with gestational diabetes over oral agents in women with preexisting diabetes.[2] The incidence of neural tube defects has been reduced by consumption of folate daily

beginning of at least one month before conception and may also reduce the incidence

of other malformations such as orofacial clefting, limb deficiencies, cardiac defects, urinary tract defects and omphalocele.[3] Increased folate intake is required for women with a history of medical conditions such as epilepsy or diabetes mellitus or a previous gestation with a neural tube defect.

Hypertension

Chronic hypertension can lead to uncomplicated pregnancy or result in lethal conditions like preeclampsia, renal insufficiency and fetal growth retardation. Review during pregnancy is required as angiotensin converting enzyme inhibitors, angiotensin[2] receptor antagonist and thiazide are associated with congenital defects if used in the first and second trimesters of pregnancy.[2] Among beta blockers, atenolo, especially when started early in pregnancy, has been associated with fetal growth restriction. Methyldopa and calcium channel blockers are commonly used during pregnancy. Patients should be evaluated for end organ damage such as retinopathy, renal disease and Left Ventricular Hypertrophy Hence fundoscopy, ECG, Echocardiography should be performed in all patients as and when necessary.

Cardiac Disease

Planning pregnancy in patients with preexisting cardiac disease should be a multi-Disciplinary exercise. The Obstetrician and Cardiologist are ideally consulted at preconceptional stage.

Preconceptional assessment should be aimed at:

- Arriving at the precise diagnosis of cardiac lesion
- Assessment of functional status
- Preconceptional care screening for maternal diseases , which are likely to

adversely impact cardiac status e.g. anaemia.

- Review of cardiac medications with an intention to discontinue or modify drugs that are harmful.
- The risk of Congenital Heart Disease in child

PCC is very important in women with artificial valves on oral anticoagulants. Most of the congenital lesions and Mitral Stenosis are better corrected surgically before the woman embarks upon a pregnancy.

Contraindications for Pregnancy (WHO)[4]

- Eisenmenger Syndrome
- Primary Pulmonary Hypertension
- Uncorrected Severe Coarctation
- Marfan's Syndrome
- Severe Mitral Stenosis with complications
- Severe Symptomatic Aortic Stenosis
- Previous Postpartum Cardiomyopathy

Psychiatric Conditions

Mentally ill women are in special need of preconception interventions. Planning for pregnancy is of particular importance in women with schizophrenia because pregnancy is a time of physical and emotional vulnerability during which psychosocial, hormonal and lifestyle changes impinge on mental health. Psychosis during pregnancy is of great concern as it can lead to fetal distress, denial of pregnancy, failure to participate in prenatal care, and/or failure to recognize the signs of labor. Neonatal complications such as fetal anomalies, placental abnormalities, preterm delivery, low birth weight, intrauterine growth retardation, and fetal and infant demise.[5] Untreated schizophrenia during pregnancy places the woman at high risk of postpartum depression, with an increased probability of suicide and infanticide. Possibly, pregnancy for a woman with schizophrenia should be planned so as

to coincide with a time of emotional wellbeing, when the woman feels well and able to handle the psychological and physiological demands of pregnancy and parenthood. It is recommended that women with mental illness be in remission for at least one year prior to considering pregnancy. Such women should be identified, properly diagnosed and treated prior to conception

Thyroid Disease

Thyroid disease is the second most common endocrine disease affecting women of reproductive age.[6] Hypothyroidism, particularly during first trimester, is associated with intellectual impairment of the offspring as well as pregnancy complications including Hypertension and preeclampsia, placental abruption, anemia, preterm birth, low birth weight and fetal death. All women with symptoms of Hypothyroidism should be screened for thyroid Disease and if hypothyroid, they should be adequately replaced. Women being treated for hypothyroidism will require increased doses of Thyroxine early and throughout pregnancy. Treatment of Thyroid conditions improve outcome. For women with Hyperthyroidism who are pregnant, the medication of choice is Propylthiouracil. Regarding Preconceptional care, euthyroidism should be achieved before conception. It is customary to avoid pregnancy for first 6 months after radioactive Iodine Treatment.[6]

Phenylketonuria

Women with Phenylketonuria should maintain low Phenylalanine diets before conception. Elevated Phenylalanine levels result in mental retardation, microcephaly, delayed speech, seizures, and behavioural abnormalities. Fetus exposed to maternal Phenylalanine levels of 20 mg/dl has 73 % chance of microcephaly and 12% chance of Congenital Heart Disease.[6]

Asthma

For 30% of women with asthma, the severity of the disease worsens during pregnancy. In patients with severe or poorly controlled asthma prior to pregnancy, disease may worsen during pregnancy. Uncontrolled asthma during pregnancy can result in serious complications for both the mother and fetus. Maternal complications include preeclampsia and Hyperemesis Gravidarum. Fetal complications include stillbirth and infant death, neonatal hypoxia, IUGR, premature birth and low birth weight. Maternal use of oral corticosteroids has been associated with reduced birthweight, increased risk of preeclampsia and increased risk of oral clefts (first-trimester use). The preferred steroid is Budesonide because this is the only inhaled corticosteroid with FDA category B.[6]

Subsequent pregnancies tend to follow a course similar to the first pregnancy in any given event. Preconceptional care for asthmatics includes counseling woman regarding medication, use of peak flowmeter, inhalers and vaccination for influenza.

Chronic Renal Disease

Women with moderate to severe renal disease before pregnancy are at risk for developing worsening renal function during pregnancy. Maternal morbidity associated with chronic renal disease include development of Preeclampsia & anemia. Adverse pregnancy outcomes include preterm delivery, IUGR, increased fetal loss and stillbirth.[6]

The potential impact of chronic renal disease is dependant on:

- The degree of serum creatinine elevation > 1.4 mg/dl
- Creatinine clearance rate <30ml/minute
- BUN > 100mg/dl
- Proteinuria 3 gram/24 hours
- Renal legions of membranoproliferative & focal glomerulonephritis.

Women in Preconceptional period should be advised to plan a pregnancy when renal function is normal or near normal to avoid worsening of the disease and reduced risk to the fetus.

Autoimmune Disease

Seventy percent of those with autoimmune disorders are women in reproductive age group.[7] Associated maternal risks include disease flares ,Hypertension and related complications. The risk to the fetus includes abortion, pregnancy loss, IUGR, Foetal Cardiac Arrhythmia and death. The Preconceptional period is the ideal time to counsel patients about these risks and advice them to plan pregnancy during a disease free period.[7]

Anaemia

Iron deficiency is the most common nutritional deficiency world wide & is a most common cause of Anaemia in pregnancy.[8] Potential fetal complications secondary to anaemia include prematurity & IUGR. Anaemia exposes the women to various maternal complications like cardiac failure, uterine inertia, post partum Haemorrhage, puerperal sepsis. Centre for Disease Control & prevention recommends 18 mg/day for women & 27 mg/day for all pregnant women. Centre for Disease Control & prevention guidelines issued during 1998 state that for girl aged 12-18 years and non pregnant women of childbearing age, iron status screening should occur every 5 years during routine examination .Annual iron screening should be conducted for a woman with existing risk factors for iron deficiency. If Anaemia is confirmed with a second test, a trial of oral iron is warranted.[8]

Thromboembolism

A personal or family history of venous thromboembolism demands testing for thrombophilia before pregnancy as a history

of a deep venous thrombosis have a 7-12% risk of recurrence during pregnancy.[2] Heparin is indicated for prophylaxis and should be started as early in pregnancy as possible. Switching from warfarin to heparin before conception is advised because warfarin is teratogenic.[2]

Epilepsy

Epilepsy in pregnancy treated with anticonvulsants is associated with an overall two-to three-fold increased risk of congenital malformation compared to the general population. The two types of congenital anomaly commonly associated with maternal epilepsy are absolute risk of 1.8% for congenital heart disease and 1.7% for facial clefts [1]. Maternal epilepsy may affect fetal and child health through the effects of seizures during pregnancy or through the genetic background associated with epilepsy.[2]

Polytherapy increases the risk of congenital anomalies, so does a genetic predisposition to decrease enzymatic action of epoxide hydrolase in the foetus. Preconceptional strategies to reduce the risk are monotherapy, switching over to drugs that are least teratogenic, discontinuation of medication if a woman had no seizure in the past 2 years, has a normal neurological evaluation and EEG and supplementation with folic acid.

Thalassemia

The progress in molecular genetics to analyze the genotype of a single cell, together with advances in assisted reproduction techniques, has paved the way for developing preimplantation and preconceptional diagnosis. These techniques are nowadays widely available, including countries where β -thalassemia is prevalent such as Cyprus. Preconceptional diagnosis is based on the analysis of the first polar body of unfertilized eggs followed by analysis of the second polar bodies after fertilization, which is performed to avoid misdiagnosis resulting from recombination during the first meiosis.

Diagnosis is obtained by multiple nested PCR analysis to detect the mutations as well as polymorphic alleles at the β -globin. Then HLA typing of the embryo to select a nonaffected fetus HLA compatible with a previous affected sibling is done. The most important challenge for the future is the organization of national preventive programs in populations in which thalassemias are prevalent such as the Middle East, the Indian subcontinent and the Far East.[9]

Rheumatoid Arthritis

Rheumatoid arthritis (RA) is the most common rheumatic disease that complicates pregnancies.[6] Fortunately, the disease remits in approximately 70-80% of patients during pregnancy, probably because of the normal shift to a less inflammatory state and human leukocyte antigen mismatch between the mother and fetus. However, 20-30% of patients will continue to have active or worsening disease during pregnancy. Active RA may increase the risk of low birthweight and corticosteroid use may increase the risk of fetal growth restriction and preterm premature rupture of membranes. Approximately 90% of patients flare in the postpartum period, usually within the first 3 months. The flare may be caused by decreased progesterone and cortisol, increased prolactin. Presently it is unclear whether breast-feeding might exacerbate postpartum flare. No treatment is curative for RA; however, several therapies modify the disease or result in the control of symptoms associated with RA. NSAIDs should be discontinued by 27 weeks gestation to avoid premature closure of ductus arteriosus. NSAIDs are compatible with breast-feeding, although there is potential risk of jaundice and kernicterus. Corticosteroids may be used, but breast-feeding should occur 4 hours after the last dosing. Hydroxychloroquine and sulfasalazine should be used cautiously, and azathioprine, cyclosporine, cyclophosphamide, methotrexate, and chlorambucil should be avoided. Patients should be advised of the natural history of the

disease during pregnancy and the likelihood of flare during pregnancy. Also, patients should be counseled about the extremely teratogenic effects of methotrexate and leflunomide and the need to discontinue these medications prior to pregnancy.[6]

Barriers to the Implementation of Preconception Care

Delivery of preconception care depends upon practitioners as understanding the barriers of preconception enables implementing the preconception care that allows more appropriate targeting of quality improvement interventions. Pregnancy is a window of opportunity for promoting positive health behaviors as it is a time when women do not practice unhealthy habits.[2] While women realize the importance of optimizing their health before pregnancy, many studies have shown that women of reproductive age demonstrate low levels of knowledge and behavior related to preconception Care.[3] The barriers were primarily related to four domains:

- (1) beliefs about capabilities;
- (2) motivations and goals;
- (3) environmental context and resources and
- (4) memory, attention and decision making.

Study has identified some of the barriers and enablers to the delivery and uptake of Preconceptional care guidelines. The biggest barrier identified is the time constraints faced by practitioners in a standard consultation. Other barriers to the delivery of Preconceptional care were the lack of women presenting at the preconception stage. Other barriers are competing preventive care issues, the availability and access to practitioners who deliver Preconceptional care, the cost associated with extending consultations to include Preconceptional care and the lack of resources for assisting in the delivery of preconception care guidelines.

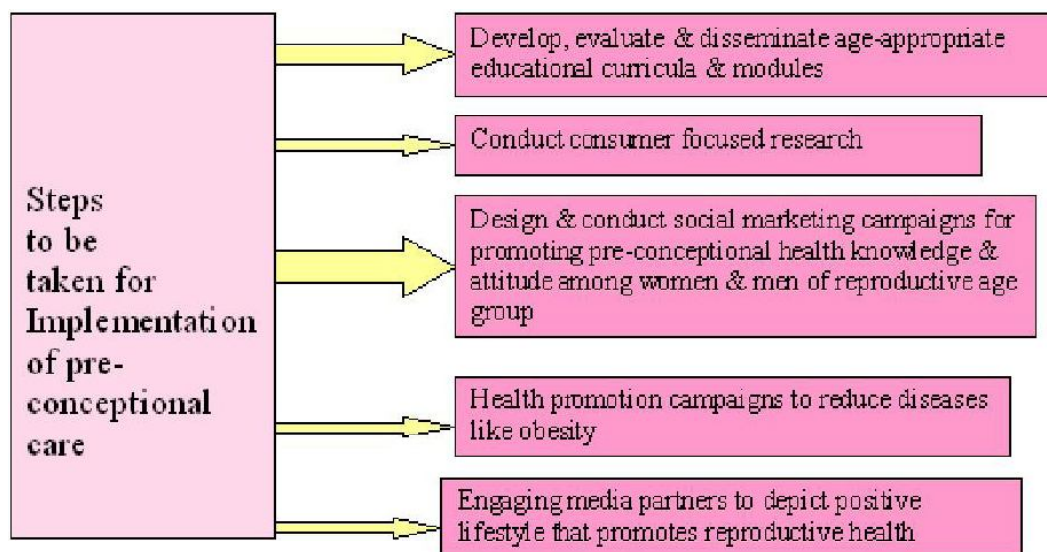
Based on such barriers the Preconceptional care guidelines should include the availability of Preconceptional care checklists as well as

patient brochures, handouts and waiting room posters which outline the benefits and availability of Preconceptional care consultations. The availability of a checklist may prove useful for practitioners as it will ensure that all aspects of the Preconceptional care are discussed with patients, even when time is limited. There is also the potential for Preconceptional care to be delivered by a practice nurse or for a risk screen to be undertaken online by patients prior to a consultation.

Dealing with Preconceptional care in an “opportunistic” way is problematic because non-attendees and those who are most in need may inadvertently be denied access to Preconceptional care. Women’s awareness is required along with attending for antenatal care at the preconception stage.

Imparting Preconceptional Care

Consideration must also be given to the views of women on the barriers and enablers to the delivery and uptake of Preconceptional care. Understanding the views of both women and practitioner consultant. Research is necessary to determine which of the target should be prioritized for intervention.. Understanding the views of both women and General Practitioner as well as the theoretical basis for changing their behavior will be essential when designing effective implementation strategies for improving the delivery and uptake of Preconceptional care. These strategies may also need to consider the role practice nurses and other health professionals may have in facilitating better uptake of Preconceptional care , especially among high-risk patients who should be actively targeted. Promotional materials and letters of invitations from General Practitioner advising patients of the availability of and the need for preconception care could also be used to increase the uptake of Preconceptional care. Given the potential for evidence-based Preconceptional care to reduce maternal and neonatal morbidity and mortality, it is essential



that effective strategies are put in place to deliver evidence based Preconceptional care guidelines.

Discussion

Preconceptional care is not a conceptual debate but a primary approach used to address various health issues and emerging national challenges. A healthy baby and a healthy mother are valued hopes and dreams of families and cultural heritage across the world.

Advances in medical Therapeutics have made more pregnancies possible in women with preexisting medical conditions. In some conditions, medical care and interventions prior to conception can have a tremendous impact on pregnancy outcome.

Preconceptional care in medical conditions must be a multidisciplinary team. Preconceptional care allows;

- Decision to allow or avoid pregnancy
- Influences on timing of conception
- Optimizes women's health and medical conditions before conception.

Preconception care should be tailored to meet the needs of the individual woman.

Because preconception care needs to be provided across the lifespan and not during only one visit, certain recommendations will be more relevant to women at different life stages and with varying levels of risk. Health promotion, risk screening, and interventions are different for a young woman who has never experienced pregnancy than for a woman aged 35 years who has had three children. Women with chronic diseases, pregnancy complications, might need more intensive interventions. Such variations also place constraints on how interventions can and should be integrated.

Health promotion and disease prevention should be integrated into a continuum of care throughout the lifecycle of woman. With an integrated continuum approach to health, rather than series of episodic events, higher levels of women's wellness will be achieved.

Striving for Preconceptional care would benefit mother, child and society, while moving towards that goal, work within existing systems to provide Preconceptional to all women, especially those at elevated risk. It

has potential for impact on pregnancy outcomes and women's health.

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