



Preconception Care - Raising the Public Awareness - Mini Review

Nadia Yousri*

Fellow of the Royal College of Obstetricians and Gynaecologist, England

***Corresponding Author:** Nadia Yousri, Fellow of the Royal College of Obstetricians and Gynaecologist, England.

Received: February 27, 2021

Published: March 08, 2021

© All rights are reserved by **Nadia Yousri**.

Abstract

This is a review of the literature on the current uptake of preconception healthcare by the users and care providers over the past ten years.

Keywords: Pre-pregnancy Preparation; Preconception Health; Pregnancy Planning; Pregnancy Intention; Public Health; Well-Women Health; Diabetes Control; Pregnancy Outcomes

Preconception care is the provision of biomedical, behavioural, and social health interventions to women and couples before conception occurs. It aims at improving their health status and reducing risk factors that contribute to poor maternal and child health outcomes. This consequently leads to improving maternal and child health, in both the short and long terms [1-3].

When we know that about 50 per cent of pregnancies in USA and 45 per cent of pregnancies and in England are unplanned, we can imagine how severe is the situation in developing countries. Complications in pregnancy happen more in women who have unplanned pregnancies. Because they could have undiscovered or uncontrolled health issue that adversely affect the pregnancy especially at the period of early development of the baby in first to twelve weeks of pregnancy. It worthy to mention that 90% of our adult brain develops during pregnancy right up to 5 years of age [4-6].

Lack of public awareness of importance of preconception health care

As a Consultant Obstetrician I find that many of our patients visit the Obstetricians when they are already pregnant. Some of the women attempting to get pregnant may have pre-existing medical conditions such as diabetes, hypertension etc, that could adversely affect their future pregnancy and the wellbeing of the unborn child. It is particularly important for those women with health problems to consider having preconception counselling. So, what the Obstetricians ideally would like to see is that women would come in- for a preconception counselling visit- before they became pregnant. Most of the harmful risk factors can be identified and adjusted in a timely planned manner to optimize the mother's health.

Preconception care has many benefits, it helps in planning and promoting couple's fertility, anticipation and prevention of

complications from happening during pregnancy and delivery like birth defects, preterm birth, and low birth weight, still birth [7-10].

Invest in preconception care-areas of care

Preconception care could help in several areas like offering Genetic Counselling and testing, controlling pre- pregnancy medical conditions and readjusting medications to eliminate harmful effects on the developing baby's organs. Fulfilling screening programmes including Cervical screening, normal thyroid gland, Haemoglobinopathies etc. We- the Obstetricians- give advices on avoiding exposure to some harmful Environmental factors and protection against infection in both the mother and the baby through infection screen and vaccination programmes, advices on suitable nutrition, weight adjustment and mineral/vitamins 'supplements and how to improve Lifestyle. We perform psychosocial assessment and support and protection against harmful domestic conditions and set plans to avoid complications in previous pregnancy from happening through a surveillance plan. We provide Advices to enhance couple's fertility efforts or Family planning ways during controlling a medical condition [10-15].

When to start the preconception care?

A healthy couple make healthy babies, so planning is the best gift the lady can give to herself and her baby. It starts by the couple discussing and agreeing on the future commitments and financial responsibilities and making sure they reach a common ground, then book for a preconception counselling with an obstetrician before she starts trying for a pregnancy. The sooner is the better, but at least 3 months before conception [16,17].

Assessments or tests to expect during preconception check-up

Full medical history and physical exam are essential to determine the general status of lady's health, checking the heart, lungs, CNS, abdomen and in addition to height, weight and blood pressure recording. Gynaecological assessment and checking cervical screening and other screening tests if required, including Sexually Transmitted Infections (STIs) which are serious illnesses that require treatment as it can be harmful to both mother and baby and let alone may cause infertility, miscarriages and pelvic pain. Blood test to check your blood group, Rh factor because the mother's body produces antibodies that can harm the baby, also checking the presence of other aberrant antibodies, Haemoglobin level to

exclude anaemia whether of deficiency type or due to abnormal Haemoglobin type like Sickle cell or Thalassemia screening, iron, Folic acid and B12 levels that lead to anemia [18-22].

Infection screen for Hepatitis B and C, HIV Syphilis, chlamydia, HPV etc [because they can be transmitted from mother to the baby through trans-placental barrier or during delivery or breastfeeding. We also check immunity against Rubella virus, varicella, toxoplasmosis, Herpes to avoid the risk of infection morbidity to the baby. Other screening tests include urine culture to exclude urinary tract infection and kidney diseases.

Genetic carrier screening

To check whether a woman or the couple are at risk of passing a genetic disorder to their baby through errors or mutations in their DNA sequence on their genes that can lead to congenital abnormalities in the baby. Genes errors may run in families or ethnicity- related. Most genetic disorders require each parent to pass down the gene. If only one partner tested positive, this is called a carrier for a certain gene (single gene disorder). If the other partner tested negative, the baby should be fine. But If both parents tested positive, then the baby has 25% chance of developing and showing the disorder.

Who should take the genetic test?

Some people know they have certain genetic conditions that run in their families would like to know if they might be carrier of the mutated gene by taking the test. Couples from planned pregnancies have unique advantages over unplanned ones, they can take actions to minimize health risks to their babies, one way to do that is through genetic testing. There are two types of tests, targeted carrier screening where you are tested based on your family history and expanded carrier screening a test for many disorders e.g. ethnicity related.

Examples of genetic carrier conditions related to ethnicity.

One of the famous examples of ethnicity-related single gene carrier status is cystic fibrosis that is more common in Caucasians ethnicity. It is a hereditary disease that affects the lungs and digestive system. The body produces thick and sticky mucus that can clog the lungs and obstruct the pancreas. Cystic fibrosis (CF) can be life-threatening, and people with the condition tend to have a shorter-than-normal life span. Hemoglobinopathies is another example that are more common in African descent.

How to do the genetic test

Testing of the Gene's DNA sequence is by taking a sample of blood, saliva, or buccal smear tissue. If both parents found to be carriers of the disease, and still would like to contemplate for pregnancy. They can use the IVF technologies and Pre-Implantation Genetic Screening/Diagnosis (PGD) to select the normal gametes/embryos for In-Utero Transfer. Alternatively, if it is natural conception, the foetus can be tested such as in case of cystic fibrosis, by a chorionic villus sampling or amniocentesis procedure this can lead to very wrenching decisions for parents.

Vaccination before pregnancy

The ideal time to get vaccinated is before the woman gets pregnant. Live-attenuated vaccines cannot be administered during pregnancy. So, preconception counselling visit is an ideal time to offer vaccinations. The famous one is for Rubella, which is contagious disease, it is rare but can be dangerous viral infection and harmful to the unborn baby if caught while the woman is pregnant. Women must take the vaccines at least three months before pregnancy. Other vaccines like Chickenpox, Measles, Mumps, HPV, Tetanus, Varicella and influenza or Covid-19 vaccines can help protect the woman and her unborn baby [18].

Diabetes and hypertension

Diabetes and hypertension are common medical conditions which could affect the pregnancy course and outcome. As a note to mention pregnancy is a diabetogenic status, reciprocally; pregnancy exacerbates diabetes and related complications. Routine screening in low-risk women is usually at 26th week in UK. It is important to have an euglycemic control (normal blood sugar level) before pregnancy, if we know that foetal organ formation occurs at approximately 3 to 10 weeks estimated gestational age and that less than 30% of diabetic women seek preconception counselling, you can see how vital period had been missed.

In the mother, a poorly controlled diabetes can lead to serious end organ damage that could become eventually lifelong health problems like diabetic nephropathy diabetic retinopathy and chronic hypertension. Ideally, A savvy endocrinologist or primary care doctors should therefore always talk to their young reproductive age women about contraception at risk of pregnancy especially if glucose control is an issue [23-29].

As for Hypertension, high Blood pressure readings when it is more than 140/90 mm Hg. Treating hypertension reduces the risk of pre-eclampsia and eclamptic seizures risk in mother and reduced risk of poor placental perfusion and eventually less Oxygen and fewer nutrients leading to slow or restricted growth and low birth weight or stillbirth [30-33].

Diet and nutrition

It is important to enter pregnancy with healthy body weight. Weight is calculated by the Body Mass Index which is a simple calculation using a person's height and weight. The formula is $BMI = \frac{kg}{m^2}$ where kg is a person's weight in kilograms and m² is their height in metres squared. A BMI of 25.0 or more is overweight, while the healthy range is 18.5 to 24.9. BMI applies to most adults 18-65 years. Being overweight or obese increases the risk of high blood pressure or diabetes and other problems during pregnant or labour. Also being underweight can make it harder to get pregnant and increase the risk of miscarriage, having a baby with a low birth weight or born prematurely. Good nutrition before pregnancy has a big impact on women health and helps to reduce birth defects. A woman needs to have at least 1500 calories daily to meet the pregnancy needs and her developing foetus. But those calories and the entire diet should be healthy and balanced. Protein helps to supply the baby with important nutrients, but some proteins are better than others. Some proteins from plants are better like those in nuts, seeds and legumes or the high lean proteins found in fish, lean meats, and black beans. Unsaturated Fatty acids should be in pregnancy diet since omega-3 fatty acid [found in butter and red meat, seafood, grass-fed beef, nuts and seeds] can help regulate fertility hormones and increase blood flow to the reproductive organs [34-40].

Physical exercises to prepare woman's body for having a baby

The healthier and more fit the mother is, the more likely you are to have a healthy pregnancy, easier delivery and healthy baby. Preconception stage is the time to work to promote your overall physical fitness and body muscle tone by doing regular exercises such as running, walking, pilates, yoga, swimming, indoor cycling. Improved general health through exercises will make your body healthier, more efficient to function optimally during pregnancy and labour. The right amount of exercise and the type of exercise the woman performs may actually enhance fertility, sense of well-being and alleviate stress because of increase of endorphins. Reg-

ular workouts like 30 minutes each day will help toning muscles including heart, reduces stress and maintains a healthy weight. Staying active before and during pregnancy has many benefits it can make labour easier on the body help reduce backaches and constipation and makes it easier to lose weight and get back into shape once the baby is born. It makes the body efficiently adapt to the physiological changes of pregnancy, reduces the risk of pregnancy-related complications and the severity of common pregnancy symptoms like backaches and bloating, constipation, lessens the chances of swelling, boosts the mood and help with sleep, it also helps prevent gestational diabetes during pregnancy, boosts baby's brain development, heart health and good growth through increasing the placental blood flow. Exercise offers huge benefits on top of having a smoother delivery due to developing healthier and stronger the abdominal and pelvic floor muscles and connective tissues are before pregnancy, the stronger they will be during and after pregnancy [41-44].

Lifestyle changes-should do before considering trying for a baby

This area is 100% under the women's control and the couple can work on to improve their health by breaking any unhealthy habits before pregnancy that could influence future pregnancy outcome. The aspects of lifestyle that can be changed for better are, having the right nutrition, achieving healthier optimal weight, performing regular exercise/physical activity, taking food supplements and avoidance of smoking, or alcohol intake or illegal drugs in addition to managing stress properly and good sleep pattern.

Cessation of tobacco (cigarette) smoking before conceiving

Women who are smokers they not aware that cigarettes contain Nicotine and tar and both put a significant risk on their own health and on their unborn child. Smoking increases the threat of preterm births as twice as much and raises the risk of congenital defects [45-47].

Alcohol and hard drugs and FAS

Foetal Alcohol Syndrome (FAS) affects babies of mothers who are heavy drinkers. It is characterised by Facial characteristics e.g. low set ears, flattened philtrum, elongated mid face, small head, upturned nose, malformation of major organs skeletal deformities, mostly cardiac. Any alcohol that is consumed while pregnant reaches the baby across the placenta, but the baby's liver cannot

breakdown the alcohol. The different effects that may happen to baby are called foetal alcohol spectrum disorders. These effects include physical, mental, behavioural and learning disabilities that can last their entire life. The most serious of these is foetal alcohol syndrome or FAS. Beside the abnormal facial features, there is also slow growth, mental conditions. The risk of FAS at its highest when the mother drinks heavily throughout pregnancy although even as little as one drink a day can cause the child to have learning or behavioural problem [48,49].

Hazards of the illicit drugs

Heroin, cocaine, cannabis, amphetamines, LSD, Barbiturates, taking illegal drugs or abusing prescription medication while being pregnant can cause miscarriages, birth defects, placental abruption and placental insufficiency. These can affect the baby's growth and lead to premature birth, more and above, if the mother is addicted to a drug the baby may also be born addicted to that drug and can suffer physical withdrawal symptoms after birth.

Planned treatment for addiction before pregnancy is important for the woman health as well as her future baby's. Women can confide in and lean on their doctor to help to get the best course of therapy.

Psychological and socioeconomic, mental health and domestic violence

Preconceptionally there is a plenty of time to assess and sort out psychosocial problems like depression and other mental health that would require certain medications or changes in lifestyle. There are links found between maternal mental health and the mental status of children. Firstly, it is a suffering for everybody, and which is unquantifiable there can also be a range of physical issues such as the baby arriving early as well as a range of emotional social and cognitive problems for the child as they develop. Domestic Violence is a major issue that affects as many as 324 thousand pregnant women per year. There is a growing body of research on the connection between relationship of violence and poor reproductive healthcare outcomes for women before and during a pregnancy.

Female Genital Mutilation (FGM) is another social taboo in some cultures that burdens the women and adds challenges. FGM is prohibited practice by law in UK.

Conclusion

The percent of unplanned pregnancy in developed countries still around 50% of total pregnancies. This signifies the need to raise the awareness and public education about the objectives and areas of preconceptional care that can achieve avoidable complications when pregnancy ensues and ultimate improvement in the health of both the mother and her baby on the short and long run. This article is meant to highlight the need to intensify the efforts towards establishing dedicated preconceptional clinics -as a new specialized- at both primary and secondary care levels.

Bibliography

1. Preconceptional Care, World Health Organization (2013).
2. Dorney E and Black KI. "Preconception care". *Australian Journal of General Practice* 47.7 (2018): 424-429.
3. Schonewille-Rosman AN., et al. "Preconception care in 2018; still too many missed opportunities". *Nederlands Tijdschrift Voor Geneeskunde* 162 (2018): D3076.
4. Smith A., et al. "Maternity Care Update: Preconception Care". *FP Essential* 467 (2018): 11-16.
5. Farahi N., et al. "Recommendations for preconception counselling and care". *American Family Physician* 88.8 (2013): 499-506.
6. Nypaver C., et al. "Preconception Care: Improving the Health of Women and Families". *Journal of Midwifery Women's Health* 61.3 (2016): 356-364.
7. Callegari LS., et al. "Preconception care and reproductive planning in primary care". *Medical Clinics of North America* 99.3 (2015): 663-682.
8. Musgrave LM., et al. "Addressing preconception behaviour change through mobile phone apps: a protocol for a systematic review and meta-analysis". *System Review* 8.1 (2019): 86.
9. Hill B., et al. "Defining preconception: exploring the concept of a preconception population". *BMC Pregnancy Childbirth* 20.1 (2020): 280.
10. Allen VM and Armson BA. "Teratogenicity associated with pre-existing and gestational diabetes". *Journal of Obstetrics and Gynaecology Canada* 29.11 (2007): 927-934.
11. Mittal P., et al. "Use of a modified reproductive life plan to improve awareness of preconception health in women with chronic disease". *Perm Journal* 18.2 (2014): 28-32.
12. Arluck JC., et al. "Preconception Care for the General Ob/Gyn". *Clinical Obstetrics and Gynecology* 61.1 (2018): 62-71.
13. Lang AY., et al. "Optimizing preconception health in women of reproductive age". *Minerva Gynecology* 70.1 (2018): 99-119.
14. Berghella V., et al. "Preconception care". *Obstetrical and Gynecological Survey* 65.2 (2010): 119-131.
15. "Preconception Advice and Management". *NICE guidelines* (2019).
16. Hussein N., et al. "The effects of preconception interventions on improving reproductive health and pregnancy outcomes in primary care: A systematic review". *European Journal of General Practice* 22.1 (2016): 42-52.
17. Jourabchi Z., et al. "Association Between Preconception Care and Birth Outcomes". *American Journal of Health Promotion* 33.3 (2019): 363-371.
18. Lassi ZS., et al. "Preconception care: preventing and treating infections". *Reproductive Health* 3 (2016): S4.
19. Coronavirus (COVID-19) infection and pregnancy, Royal College of Obstetricians and Gynaecologists, Guideline version 13 (2021).
20. Schwartz DA and Graham AL. "Potential Maternal and Infant Outcomes from (Wuhan) Coronavirus 2019-nCoV Infecting Pregnant Women: Lessons from SARS, MERS, and Other Human Coronavirus Infections". *Viruses* 12.2 (2020): 194.
21. Pereira L. "Congenital Viral Infection: Traversing the Uterine-Placental Interface". *Annual Review of Virology* 5.1 (2018): 273-299.
22. Costa MC., et al. "Sexually transmitted diseases during pregnancy: a synthesis of particularities". *Anais Brasileiros de Dermatologia* 85.6 (2010): 767-782; quiz 783-785.
23. Wahabi HA., et al. "Preconception care for diabetic women for improving maternal and fetal outcomes: a systematic review and meta-analysis". *BMC Pregnancy Childbirth* 10 (2010): 63.

24. Wahabi HA, *et al.* "Systematic review and meta-analysis of the effectiveness of pre-pregnancy care for women with diabetes for improving maternal and perinatal outcomes". *PLoS One* 15.8 (2020): e0237571.
25. Temple R. "Preconception care for women with diabetes: is it effective and who should provide it?" *Best Practice and Research: Clinical Obstetrics and Gynaecology* 25.1 (2011): 3-14.
26. Wei Y, *et al.* "Preconception diabetes mellitus and adverse pregnancy outcomes in over 6.4 million women: A population-based cohort study in China". *PLoS Medicine* 16.10 (2019): e1002926.
27. Davidson AJF, *et al.* "Association of Improved Periconception Hemoglobin A1c With Pregnancy Outcomes in Women With Diabetes". *JAMA Network Open* 3.12 (2020): e2030207.
28. Leow SN, *et al.* "Patient perception of pre-pregnancy care and family planning among reproductive-age female diabetes mellitus patients in a primary care clinic in Penang, Malaysia". *Malaysian Family Physician* 15.3 (2020): 35-42.
29. "Diabetes in pregnancy: Management from Preconception to the Postnatal Period". NICE Guidelines [NG3] (2015).
30. Steel A, *et al.* "The prevalence and nature of the use of preconception services by women with chronic health conditions: an integrative review". *BMC Womens Health* 15 (2015): 14.
31. Stanhope KK and Kramer MR. "Association Between Recommended Preconception Health Behaviors and Screenings and Improvements in Cardiometabolic Outcomes of Pregnancy". *Preventing Chronic Disease* 18 (2021): E06.
32. Teysseire R, *et al.* "Perception of Environmental Risks and Behavioral Changes during Pregnancy: A Cross-Sectional Study of French Postpartum Women". *International Journal of Environmental Research and Public Health* 16.4 (2019): 565.
33. Chabert MC, *et al.* "Lack of information received by a French female cohort regarding prevention against exposure to reprotoxic agents during pregnancy". *European Journal of Obstetrics and Gynecology and Reproductive Biology* 205 (2016): 15-20.
34. Spencer L, *et al.* "The effect of weight management interventions that include a diet component on weight-related outcomes in pregnant and postpartum women: a systematic review protocol". *JBIC Database System Rev Implement Report* 13.1 (2015): 88-98.
35. Dean SV, *et al.* "Preconception care: nutritional risks and interventions". *Reproductive Health* 3 (2014): S3.
36. Martin JC, *et al.* "The Assessment of Diet Quality and Its Effects on Health Outcomes Pre-pregnancy and during Pregnancy". *Seminars in Reproductive Medicine* 34.2 (2016): 83-92.
37. Grieger JA, *et al.* "Pre-pregnancy fast food and fruit intake is associated with time to pregnancy". *Human Reproduction* 33.6 (2018): 1063-1070.
38. Wilson RD, *et al.* "Pre-conceptional vitamin/folic acid supplementation 2007: the use of folic acid in combination with a multivitamin supplement for the prevention of neural tube defects and other congenital anomalies". *Journal of Obstetrics and Gynaecology Canada* 29.12 (2007): 1003-1013.
39. Wilson RD, *et al.* "Pre-conception Folic Acid and Multivitamin Supplementation for the Primary and Secondary Prevention of Neural Tube Defects and Other Folic Acid-Sensitive Congenital Anomalies". *Journal of Obstetrics and Gynaecology Canada* 37.6 (2015): 534-552.
40. Bjørklund G, *et al.* "The Role of Vitamins in Autism Spectrum Disorder: What Do We Know?" *Journal of Molecular Neuroscience* 67.3 (2019): 373-387.
41. Harrison CL, *et al.* "The Role of Physical Activity in Preconception, Pregnancy and Postpartum Health". *Seminars in Reproductive Medicine* 34.2 (2016): e28-37.
42. Gaeini AA, *et al.* "Preconception endurance training with voluntary exercise during pregnancy positively influences on remodeling markers in female offspring bone". *Journal of Maternal-Fetal and Neonatal Medicine* (2016).
43. Hill B, *et al.* "Psychological Health and Lifestyle Management Preconception and in Pregnancy". *Seminars in Reproductive Medicine* 34.2 (2016): 121-128.

44. Teede H and Moran L. "Lifestyle Factors Focused on Diet and Physical Activity: Recommendations Preconception and During Pregnancy". *Seminars in Reproductive Medicine* 34.2 (2016): 65-66.
45. Lassi ZS, *et al.* "Preconception care: caffeine, smoking, alcohol, drugs and other environmental chemical/radiation exposure". *Reproductive Health* 3 (2014): S6.
46. Ioakeimidis N, *et al.* "Smoking cessation strategies in pregnancy: Current concepts and controversies". *Journal of Cardiology* 60.1 (2019): 11-15.
47. Lan L, *et al.* "Systematic review and meta-analysis of the impact of preconception lifestyle interventions on fertility, obstetric, fetal, anthropometric and metabolic outcomes in men and women". *Human Reproduction* 32.9 (2017): 1925-1940.
48. Denny L, *et al.* "Fetal Alcohol Syndrome and Fetal Alcohol Spectrum Disorders". *American Family Physician* 96.8 (2017): 515-522.
49. Georgieff MK, *et al.* "Atypical fetal development: Fetal alcohol syndrome, nutritional deprivation, teratogens, and risk for neurodevelopmental disorders and psychopathology". *Development and Psychopathology* 30.3 (2018): 1063-1086.

Assets from publication with us

- Prompt Acknowledgement after receiving the article
- Thorough Double blinded peer review
- Rapid Publication
- Issue of Publication Certificate
- High visibility of your Published work

Website: www.actascientific.com/

Submit Article: www.actascientific.com/submission.php

Email us: editor@actascientific.com

Contact us: +91 9182824667