



OPTIMISE HEALTH PRIOR TO NATURAL CONCEPTION OR PLANNED IVF



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Most often, fertility teams using In Vitro fertilization (IVF) technology, have been focused on ensuring success through stimulation regimens and laboratory procedures to maximise outcomes. With these steps optimised, the emphasis shifts to other areas of improvement. Today, it is recognised that parenting begins before conception. The early embryo is vulnerable at the time of implantation and early fetal development; hence this time period needs to be optimal to grow into as healthy a human being as possible.

Hegde Fertility believes that in IVF, while there is a significant effort and cost in achieving pregnancy, every effort must be taken to ensure children are born in optimal conditions to enjoy a healthy life.

EFFECTS OF NUTRITION ON REPRODUCTIVE SUCCESS

Majority of men and women with subfertility, regardless of weight, have a form of intrinsic insulin resistance that underlies the downstream effects on oocyte or sperm quality.

Lifestyle interventions [such as weight loss, increasing physical activity and muscle mass, improving sleep quality and stopping smoking] should be a major target in optimising outcomes in men and women with subfertility.

High intake of fibre from grains and cereals improves insulin sensitivity. Diet with a lower glycemic load were found to reduce fasting insulin. Carbohydrate restriction [45%] and modestly increased protein [25%] and fat [30%] will facilitate weight reduction and weight maintenance as well as long-term health.

Micronutrients like iodine, iron, folate, etc. deficiencies or excesses during critical stages of will influence fetal growth and development. The science of epigenetics is showing that specific fetal genes are permanently altered by the fetal environment.

EFFECTS OF STRESS ON CONCEPTION

Infertile individuals experience stress because their capacity to reproduce does not meet their desire, thereby causing emotional burden, including depressive and anxiety symptoms. There is some evidence that high stress is related to low fertility rates. The most effective treatment is psychosocial. The counsellors at Hegde Fertility can help avoid unhealthy lifestyles and IVF drop out.

THYROID: As thyroid hormone determines the function of all cells within the body of the women, and thyroid hormones of the fetus are maternally derived until 12 weeks of gestation, addressing thyroid function prior to IVF is of paramount concern. A thyroid assessment should be made six months prior to treatment. Further, the presence of anti-thyroid antibodies may be of concern, particularly in women with a history of recurrent miscarriage or second trimester fetal loss. When planning for pregnancy aim for TSH level less than or equal to 2.5 mIU/L.

DIABETES: Patients with long term diabetes mellitus should achieve glycaemic control in the preconception stage with levels lower than routinely advised for the non-pregnant state.

Women who are older, more obese, and/or have PCOS are at risk of impaired glucose tolerance or gestational diabetes mellitus (GDM). These women also require high-dose folic acid supplementation and if using metformin, will need vitamin B-12 supplementation also.



ASSESSMENT OF PELVIC ABNORMALITIES

The nature of the presenting symptoms may give an indication of a pelvic factor.

Pubertal abnormalities and developmental disorders	Congenital abnormalities
Menstrual disorders	Congenital abnormalities
Heavy menstrual bleeding	Fibroids, Adenomyosis
Light menstrual bleeding	Intrauterine adhesions
Intermenstrual bleeding	Intrauterine adhesions, endometrial polyps, fibroids
Menstrual pain	Endometriosis, fibroids, adenomyosis
Sexual pain	Endometriosis, fibroids, adenomyosis
Cyclical urinary and bowel dysfunction	Endometriosis

INFERTILITY WITH ENDOMETRIOSIS

Endometriosis is a disease characterised by the presence and proliferation of endometrial tissue outside the uterus, found in 25-50% of infertile women.

Women suspected of having endometriosis, according to symptoms and signs (dysmenorrhea, diarrhea, dyschezia or dyspareunia) are followed up through ultrasonography, CA 125 and laparoscopy is performed to confirm diagnosis.

Postoperative medications have shown efficacy in preventing the recurrence of endometriosis. Regular and prolonged medication until the patient wishes to conceive is highly recommended.

The reactive oxidative stress (ROS) resulting from endometriosis, not only influences the quality of oocyte, but also the intrauterine environment that is crucial for implantation. Certain protocols during IVF can improve pregnancy rates by reducing the level of ROS and inflammatory cytokines released by the endometriosis.

A pelvic transvaginal scan has become an integral component of any fertility assessment. Hysterosalpingogram (HSG) is a test for confirming patency of the fallopian tubes through the injection of a contrast dye. The decision to proceed to laparoscopy and hysteroscopy has to be based on a balance between benefits in terms of fertility enhancement, procedure associated risks, cost-effectiveness and patient preference.

VACCINATION AND VAGINAL MICROBIOME PRIOR TO IVF

Women screening should include Pap smear, blood group, annual influenza vaccination and routine rubella vaccination. HIV, HBsAg, HCV have been routinely recommended for those undergoing IVF.

Majority of vaginal bacteria are from the lactobacillus species, which promote embryo health and implantation. There is a potential link between disturbance in the vaginal microbiome and risk of preterm delivery and low birthweight infants.

OPTIMISING BODY WEIGHT TO IMPROVE REPRODUCTIVE SUCCESS

Maternal obesity has been conclusively linked with a myriad of obstetric complications such as miscarriage, gestational diabetes, preeclampsia and gestational hypertension, preterm birth, cesarean delivery, thromboembolism, risk of surgical site infection, prolonged inpatient stay, reduced chances of successful breast-feeding and maternal depression. It also significantly increases the risk of intrauterine fetal death and congenital abnormalities such as neural tube defects, cardiac septal, defects and cleft palate.

Babies born to obese mothers are more likely to be macrosomic, leading to delivery morbidity plus increased risk of neonatal intensive care admission. There are now emerging concerns that maternal obesity may result in long-term negative consequences such as increased risk of adult-onset obesi-

ty diabetes, hypertension, and even impaired fertility for the child.

Overweight and obese men have reduced fertility potential with an increased risk of infertility of 18% and 53% respectively. There is primarily a reduction in sperm concentration and an increase in sperm oxidative stress which may reduce sperm motility and increase DNA damage. Reduced libido and erectile dysfunction are considerably more common in obese men, due to reduced testosterone production.

If behavioral approach for weight loss is not successful, weight loss medication can be considered. In morbidly obese women with significant comorbidities such as poorly controlled diabetes or hypertension, bariatric surgery should be considered.



LIFESTYLE MODIFICATIONS

Successful smoking cessation represents an important part of effective infertility treatment. The detrimental effects of passive smoking is similar to those in smokers.

Complete abstinence from alcohol for both partners is the safest recommendation in couples, desiring optimal fertility. Binge drinking particularly should be avoided.

Women who are pregnant or trying to conceive must limit caffeine consumption to less than 200-300mg per day.

Complete abstinence from illicit drugs like marijuana, cocaine, amphetamines, opioids and anabolic androgenic steroids are advisable.

Stopping adverse lifestyle and toxic exposure at least 3-6 months before initiating fertility treatment is recommended.

ENVIRONMENTAL FACTORS TO CONSIDER PRIOR TO CONCEPTION

Over 800 endocrine disrupting chemicals (EDCs) are found in everyday items including the plastics of food containers, personal care items, cosmetics, preservatives, food products, paints, industrial lu-

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bricants, fluids for electrical devices, copy paper, clothing, furniture, mattress, flame retardants, waste incineration, microwaving plastics, dental fillings, and are also being used within manufacturing, industrial and agricultural processes.

Most EDC's act via, interfere with, or mimic steroid hormones: predominantly estrogen and androgen pathways or thyroid hormones, thereby having a negative impact on reproduction and development. They include Bisphenol A (BPA), phthalates, parabens, persistent organic pollutants, heavy metals, pesticides, etc.?

TIPS TO LOWER EXPOSURE TO ENVIRONMENTAL TOXINS

- Never drink out of or heat food in soft plastic containers
- Consume fewer processed/ pre-canned/ pre-packaged foods
- Wash fresh produce prior to consumption
- Limit consumption of fatty or oily fish
- Reduce the use of personal care products [makeup, shampoos, hair colour etc.] especially those with high concentrations of environmental chemicals
- Avoid handling till receipts and exposure to strong solvent based chemicals [paints, cleaning products, glues etc.] industrial processing chemicals and heavy metals.
- Be aware that replacement analogues [example BPS and BPF] aren't necessarily "safer" options.

PRE-PREGNANCY GENETIC CARRIER SCREENING

This screening helps identify asymptomatic individuals who are at increased risk of passing inherited genetic disorders to their offspring. It is recommended for individuals with a strong family history of a genetic disease.

A carrier is a healthy individual who is not affected by the genetic disease, yet harbors, one copy of a genetic mutation. As genetic testing methodologies have become more sophisticated, feasible and cost-effective, extensive discussion on the role of expanded carrier testing for the general population has emerged, which includes over hundred genetic conditions.

Couples found to be positive carriers of a recessive condition, can be informed of the reproductive implications and transmission risk to offspring, and can consider the complete range of reproductive options prior to conception. For some patients, knowledge of an increased risk of having an effective child, may play a pivotal role on the decision to conceive, or consideration of alternative options such as IVF with pre-implantation genetic diagnosis [PGD], use of donor gametes, adoption or early prenatal diagnostic testing.

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OPTIMAL AGE FOR CHILDBEARING

There is evidence that women who delay childbearing are more likely to have completed a higher level of education, have stable employment and more wealth. They are less likely to be smokers, more likely to have a healthy diet and book early for and attend antenatal care. These factors are all likely to lead to better long-term health outcomes for both the women and their babies.

Unfortunately, with increasing age there are increased risks of miscarriage, still birth, preterm delivery, cesarean section and an increase in prevalence of medical conditions, which, potentially affect pregnancy, such as high blood pressure, diabetes, ischemic heart disease and kidney disease.

There is clear evidence of a reduction in fertility after 35 years, as the quality and number of oocytes begin to decline. Women over 35 are more likely to require assistance in becoming pregnant, compared to their younger counterparts. Further, IVF is less likely to be successful in older women, and shouldn't be regarded as a means of prolonging natural fertility.

With age, the percentage of normal oocytes in a woman's ovarian reserve reduces, and conceiving using an oocyte with an abnormal chromosomal structure is more likely. The commonest chromosomal abnormality seen in live born babies is down syndrome. Women who undergo IVF may undergo preimplantation genetic screening to reduce the risk of having a child affected by chromosomal abnormality. Once pregnant, women can be screened using a combination of ultrasound and biochemical testing.

From a purely biological standpoint, the ideal age for pregnancy appears to be between 25-29 years, with increased risk of complications at either end of the reproductive age spectrum.

For more details, contact:

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