



IMPACT OF OBESITY ON REPRODUCTION

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ABSTRACT:

Obesity is defined as Body Mass Index (BMI) of $>30\text{Kg}/\text{m}^2$. Obesity has reduced life expectancy. It is now recognized that obesity exerts an adverse effect on pregnancy. Obese women have more infertility and are less successful at conceiving than woman of normal weight. Obesity decreases successful pregnancy rates in both natural and assisted conception cycles.

The mechanism by which obesity reduces pregnancy rates are complex and multifactorial. Insulin resistance appears to be a key factor of obesity. It decreases ovulation rates and increase biochemical abnormalities. Insulin resistance also causes Polycystic Ovarian Syndrome. Adipose tissue has been shown to disturb sex hormones secretion and bioavailability. Some psychological and socio-biological factors are also responsible for reduced fertility in obese women.

Keywords: - Obesity, Reproduction, Pregnancy, Overweight.

INTRODUCTION :

Obesity can be measured in the form of Body-Mass Index. People having Body-Mass Index more than $30\text{ kg}/\text{m}^2$ are called as obese and industrialized countries, obesity among ordinary people has become perhaps an important burden for the health system and must be regarded as a serious public health issue. It is now recognized that increased body fat is associated with heart disease, stroke, hypertension, dyslipidemia, type-2 diabetes mellitus, gall bladder diseases, osteoarthritis, sleep apnea and respiratory problems and numerous types of cancer. Recent researches suggest that rise in obesity is primarily due to altered sedentary lifestyles, energy-dense diets and low levels of physical activity.

In contrast to its effects on other areas of health, the impact of obesity on reproduction has received less attention. Obesity is characterized by excess lipid storage. Central/abdominal obesity is defined by an increased waist

circumference and waist: hip ratio which has been observed to have negative effect on fertility. A waist circumference $> 80\text{ cm}$ is an accepted indicator of visual fat accumulation.

The present article aims to focus on the influence of obesity on reproduction process. Perhaps there is a well established connection between obesity and reproductive problems which ultimately has an adverse effect on fertility.

Effects of obesity on fertility in female:

According to Brewer and Balen (2010), obese women are more infertile and are less successful at conceiving than women of normal weight. It was observed that obese women had a 45% lower fertilization rate when compared with normal women. Once pregnant, obese women are more likely to have complicated pregnancies and are less likely to have a live- born babies because of higher rates of miscarriage, ectopic pregnancy and still birth. The babies born to obese women are more likely to die in the first

month of life. Babies of overweight/obese mothers gained less weight and grew less in length than babies of normal weight women. It implies that the obesity epidemic is harming children while they are still in womb. Babies experience distress labor in the pregnancies of obese women. As a result of this problem, obese women are delivered by cesarean than normal weight women.

Maternal obesity is associated with increased morbidity and mortality for both mother and offspring. A complex set of hormones work in balance to control menstrual cycle, ovulation and development of endometrium. Obesity has been demonstrated to disturb hormonal imbalance in reproductivity processes via several direct and indirect mechanism. Adipose tissue has been to disturb sex hormones, secretion and bioavailability. Adipose tissue is the important site of steroid production and metabolism. Indirectly, obesity exerts its effect via leptin and insulin hormone.

Obesity decreases successful pregnancy rates in both natural and assisted conception cycles. The mechanism by which obesity reduces pregnancy rates are complex and multifactorial. Insulin resistance appears to be a key factor of obesity (Catalano,2010). It decreases ovulation rates and increase biochemical abnormalities. Insulin resistance also causes Polycystic Ovarian Syndrome. This syndrome in obese women promotes ovarian androgen secretion and follicular development leading to dysfunction of ovarian and menstrual activity. The increased insulin resistance in obese pregnant women leads not only to pregnancy complications for the mother but also greater growth and disproportionately greater fat deposition for the baby.

Obesity also increases the rates of miscarriage, thus further decreasing successful pregnancy rates in obese women. It is observed that obese women, particularly those with central obesity

are less likely to conceive per cycle. Obese women suffer menstrual cycle disturbance and are up to three times more likely to suffer oligo/anovulation (less or no ova formation). It has been observed overweight women had significantly fewer oocyte numbers. It was also studied that intrafollicular human chorionic gonadotrophic (HCG) concentration was significantly lower in obese women.

Overweight women were 50% more likely to have ectopic pregnancies (a pregnancy outside of the uterus, usually in the fallopian tube). It has been observed that hormonal balance regulates follicular development and oocyte maturation, but obesity causes hormonal imbalance. Leptin, a hormone produced by adipocytes, is elevated in obese women and this result with impaired fecundity, a reduced ovulation affect endometrial development and implantation (Usha Kiran et al.2005). It has been studied that increase levels of leptin and low level of adenopectin reduces conception rates.

Effect of obesity on fertility in male:

In contrast to this effect on female fecundity, there is much less evidence that obesity adversely affect male fertility. It is observed that obese men have lower total and free testosterone levels. Men with increased BMI (above 35) show the incidence of low sperm count (oligospermia) and poor sperm motility (asthenospermia). It is studied men has little differences in semen qualities but there are major differences in reproductive hormone levels with increasing weight.

Effect of obesity on sex drive:

Many Obese women have reduced fertility due to psychological and socio-biological factors. Sexual function may also be affected by obesity. Prolonged time to conception could be secondary to a comparative reduction in sexual frequency. It has been demonstrated that obese people do not have sexual intercourse as frequently as thinner people. It was suggested that the

decreased sex drive in the obese women may be derived due to decreased level of dopamine activity and increased level of serotonin levels in the brain. Obese women are likely to experience sexual dysfunction..

Control measures to increase fertility after weight loss:

1. Weight loss improves reproductive function in overweight and obese women. It is therefore important that obese women should attend fertility clinic for necessary advice and support to achieve necessary weight loss.
2. There should be careful counseling on diet and exercise; dietary education and guidance should ideally be given by a trained dietician.
3. Obese and overweight women should undertake a programme of exercise containing a sufficient quantity of aerobic activity.
4. It is essential to emphasize the importance of making lifestyle modification that are sustainable and healthy.
5. Any weight reducing agent used should be stopped when pregnancy is confirmed.
6. Bariatric surgery involves either reducing the stomach capacity or reducing absorption through anatomical modification. Bariatric surgery is used to treat morbid obesity in women of reproductive age, who could not reduced weight loss through diet and exercise.
7. Women conceiving after bariatric surgery should receive careful counseling by a dietician to reduce the risk of nutritional deficiency.
8. Pre-conception counseling is necessary for stable normal weight before natural or assisted conception.

CONCLUSION:

Obesity not only affects reproduction processes but also has important consequences upon the health and outcome of the ensuing pregnancy. Obesity has been observed to affect both natural and assisted conception. Obesity affects ovulation, oocyte maturation, endometrial development, uterine receptivity, implantation and miscarriage. Weight loss through diet and exercise is the first line therapy for all obese women seeking fertility treatment. Some improvement in reproductive function can be overcome by weight loss surgery. This will improve both fertility and feto-maternal health in the ensuing pregnancy. Thus, it is likely that the challenge of obesity will remain for short time for reproductive biologist.

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