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### Emerging needs of successful pregnancy: Physiological development and psychological changes.

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#### Abstract

This article provides a brief overview of the physiological and psychological changes during pregnancy. The pregnancy period is a very complex and memorable phase in the life of Women. Physiological changes during pregnancy are essential to nurture the developing fetus and prepare the mother for labor and no complication delivery. Several physiological and psychological changes occur in women's body and in her mental conditions. A woman must be aware about these changes during the whole period of her pregnancy. Healthy woman can give birth to a healthy baby adopting these changes and development, In other words complication free delivery can be achieved after being aware with these biological changes. Any pregnancy related medical complications can be treated in time keeping these developments and prepare a solid base for the healthy development of human being in coming years.

**Keywords:** Physiological Development, Psychological Change, Pregnancy Period, Nutritional Value.

#### Introduction

Pregnancy is the term used to describe the period in which a fetus develops inside a woman's womb or uterus. Pregnancy is a happy memorable and marvelous phase in the women's life which is very important for the continuation of human existence in the world. Every mother desires her pregnancy with zero complications and without any challenges. The quality of Human Resource of any country is largely determined by the quality and care of its child development and women's health. The intimate relationship between the physiological and psychological wellbeing of a mother and her child has always been emphasized and remarkable.

#### Objective of study

Pregnancy is a memorable period of significant physiological development along with psychological and emotional changes that took place in the body and in behavior of women. Highlighting these changes and development, a brief study of such changes during pregnancy has been undertaken, in order to make pregnant women understand about the development and behavioral changes, so that their pregnancy period proves to be the one with zero complication and less problems and to cope with the post- delivery changes with a much better way. As we know that "A healthy woman can give birth to a healthy baby". Hence, a brief study has been conducted to make every pregnant women aware about physiological and psychological changes and the importance of nutritional rich diet to give birth a healthy baby thus, preparing a solid base for a healthy and disease free human being in later stages of life.

#### Discussion and Analysis

Pregnancy begin with conception, in which a sperm penetrates an egg. The fertilized egg (called a zygote) travels through the woman's fallopian tube to the uterus, where it implants itself in the uterine wall. Pregnancy is the time of significant physiological and psychological changes which can be observed in following stages in a systematic manner.

Physiological and Psychological developments are very normal which include, cardiovascular, hematologic metabolic, renal (kidney), posture, and respiratory changes and behavioral changes. Increases in blood sugar, breathing, and cardiac output are all expected changes that allow a pregnant woman's body to facilitate the proper growth and development of the embryo or fetus during the pregnancy period.

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The physiological and biochemical development of the egg begins after fertilization. Normally fertilization occurs within 48 hours of ovulation.

Implantation begin approximately 7 days after fertilization, with the blastocyst adhering to, and later begin embedded in the walls of the uterus when fertilization occurs.

Various stages of development of the fetus following fertilization <sup>[1]</sup>.

Age	Development event
1-3 days	Cleavage of zygote in fallopian tube.
4-7 days	Blastocyst develop in the uterus.
7-13 days	Implantation.
3 weeks	Embryo is three layered Raw, Heartbeat begin.
4 weeks	Organs rapidly developing.
5 weeks	Umbilical cord organized.
6 weeks	Thyroid and parathyroid present Hemopoiesis begins in the liver.
10 weeks	Kidney begin secretion.
12 weeks	First islets in pancreas.

There are various changes in amniotic sac, umbilical cord, placenta, can be observed during the course of progression of pregnancy.

### Hormonal changes

Numerous Hormonal changes in endocrine system is observed to support developing fetus. The fetal-placental unit secretes steroid hormones and proteins that alter the function of various maternal endocrine glands.

Progesterone and estrogen level rise continually throughout pregnancy period. Women experience increased human chorionic gonadotropin ( $\beta$ -hCG), which is produced by the placenta.

### Pancreatic insulin

The placenta produces human placental lactogen (HPL), which stimulates maternal lipolysis and fatty acid metabolism, this conserves blood glucose for use by the fetus. It can also decrease maternal tissue sensitivity to insulin, resulting in gestational diabetes.

### Pituitary gland

The pituitary gland grows by about one-third as a result of hyperplasia of the lactotrophs in response to the high plasma estrogen<sup>2</sup>. Prolactin, which is produced by the lactotrophs increases progressively throughout pregnancy. Prolactin mediates change in the structure of the breast mammary glands from ductal to lobular-alveolar and stimulates milk production.

### Thyroid

Thyroid enlarges and may be more easily felt during the first trimester. The increase in kidney clearance during pregnancy causes more iodide to be excreted and causes relative iodine deficiency and as a result an increase in thyroid size. Estrogen-stimulated increase in thyroid-binding globulin (TBG) leads to an increase in total thyroxine (T4), but free thyroxine (T4) and triiodothyronine (T3) remain normal.<sup>3</sup>

### Breast changes

Women's breast change during pregnancy to prepare them for breastfeeding a baby. Normal changes include

- Tenderness of the nipple or breast.
- An increase in breast size over the course of the pregnancy.
- Changes in the color or size of the nipples and areola.
- More pronounced appearance of Montgomery's tubercles.

The volume of each breast increase by up to 1/3 from the 12<sup>th</sup> week and from about the 16<sup>th</sup> week of pregnancy the breasts begin to produce milk. There is a clear yellow secretion from the nipples, called Colostrums. It contains fat, water, albumin, and colostrums cells.

### Cardiovascular changes

Cardiac output increases throughout early pregnancy and peaks in the third trimester, usually to 30-50% above baseline. The heart adapts to the increased cardiac demand that occurs during pregnancy in many ways, as blood pressure, Cardiac output, Stroke volume, heart rate <sup>[4]</sup>.

### Blood circulation changes

The plasma volume increases by 40-50% and the red blood cell volume increases only by 20-30% during pregnancy. These changes occur mostly in the second trimester and prior to 32 weeks gestation <sup>[5]</sup>. The number of white blood cells also increases during pregnancy but the amount of calcium decreases in the blood. The amount of fibrinogen and platelets increases in the blood. The systolic blood pressure is approximately 110 to 120 and the diastolic pressure is 65 to 80. The Heartbeat also increases to a 78 beats per minute since the activity of the heart increases.

### Metabolic changes

Both protein metabolism and carbohydrate metabolism are affected during pregnancy. One kilogram of extra protein is deposited, with half going to the fetus and placenta, and another half going to uterine contractile proteins, breast glandular tissue, plasma protein, and hemoglobin.

### Body weight

Some degree of weight gain is expected during pregnancy. The enlarging uterus, growing fetus, placenta, amniotic fluid, normal increase in body fat, and increase in water retention all contribute weight gain during pregnancy. The amount of weight gain can vary from 10 kg to 17 kg.

### Nutritional changes

Nutritionally, pregnant women require a caloric increase of 350 kcal/day and an increase in protein to 70 or 75 g/day. There is also an increased folate requirement from 0.4 to 0.8 mg/day. Pregnant women are advised to take prenatal vitamins to compensate for the increased nutritional requirements. The use of Omega 3 fatty acids supports mental and visual development of infants.

### Renal changes

Pregnant women may experience an increase in the size of the kidneys and ureter due to the increase blood volume and vasculature. This increase the amount of blood to flow to the kidneys which increase the glomerular filtration rate (GFR) by up to 50% and excess urea or uric acid is expelled from the body. The increased GFR leads to increased urinary output, which the woman may experience as increased urinary frequency. Progesterone also causes decreased motility of the ureters, which can lead to stasis of the urine and hence an increased risk of urinary tract infection.

### Respiratory changes

Oxygen consumption increases by 20% to 40% during pregnancy, as the oxygen demand of the growing fetus, placenta, and increased metabolic activity of the maternal organs all increase the pregnant woman's overall oxygen requirements

There are many physiologic changes that occur during pregnancy that influence respiratory status and function. Progesterone has noticeable effects on respiratory physiology, increasing minute volume (the amount of air breathed in and out of the lungs in 1 minute) by 40% in the first trimester via an increase in tidal volume alone, as the respiratory rate does not change during pregnancy [6].

### Psychological changes

Pregnancy is a time of significant psychological change, it is the period of great Psychological changes and advancement. Psychological maternal-fetal attachment commences fairly early in pregnancy and increases over gestation, culminating in the birth of an infant. Emotional fluctuations (between positive and negative feelings) are common during the entire pregnancy. Mild and temporary negative emotions such as low mood, fear or anxiety, ambivalence, conflict, and regression are very common during pregnancy.

In other words, we can say that psychological changes during pregnancy help in the preparation and adaptation for parenthood, self-identity, couple relationship and attachment. This would also help in detecting and addressing any mental health problems at a very early stage.

### Literature review

An essential aspect of an investigation is the review of the related literature in any field forms foundation upon which all future work and search will be built. Review of literature increases the value of research by creating a critical and brief analysis of the research problem and evaluation of related studies. In other words we can say that review of literature is backbone of the whole research work and create background for selection of procedure, help the investigator in adaptation of tools and provide comparative data to evaluate and interpret significance of ones data. In this study we are primary concern in reviews related to assessment of previous reproductive history and health status of pregnant women and assessment of nutrient dietary habits of pregnant women.

Sharma and Gulati 1990 study the symptoms and sign of nausea, vomiting and malaria.

Rangnekar and Darbar 1993 study that 40% to 70% of Indian pregnant women have hemoglobin level less than 10g/dl causing a number of pregnancy complications.

WHO 1995 found that termination of pregnancy can be risky to a women's health to certain group of very young women, old woman, women with more than four children and women with existing health problem.

Allen 2000 found that maternal iron deficiency anemia is associated with risk of pre-term delivery and subsequent low birth weight and may contribute to low iron status in the Infant.

Sood and Kapil 1984 reported their experiences on the nutritional behavior of expectant mothers in rural India.

Maliha and umapati 1986 stated that food habit and food beliefs are among the oldest and most entrenched aspects of any culture.

Food and nutrition Board 1989 suggested that pregnant vegetarian should choose high iron food like whole grain legumes, tofu and green leafy vegetable daily and consume

them with food rich in vitamin C to increase the bioavailability of the iron. It is recommended that pregnant women consume 60 grams of protein a day or only 10 grams more than non-pregnant women.

Mahapatra *et al.* 1990 observed that maternal nutrition is often considered as an important regulator of human foetal growth.

### Conclusion

Pregnancy is one of the most critical and unique in a woman's life cycle. It is the period in the life of an adult women that unborn baby grows inside her body and to support the growth of the fetus, certain physiological development and psychological changes take place in the woman's body. This physiological and psychological changes take place to support and nourish the fetus overall development inside the body of women. Many factors affect the outcome of pregnancy in which nutrition is one of the most important factor. Pregnant women must be aware about her physiological development so that if there is a problem inside, that can be treated on time and safe and no-complication delivery can be expected. As well as pregnant women should be prepared psychological and emotionally attached to new bodily changes and be ready to face any worst condition if any.

When mother will become conscious and alert towards their pregnancy related physical and psychological change and take nutritious diet then it will reduce the infant mortality and maternal mortality rate.

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