A review on Nutritional requirements during pregnancy

Rode Nikita Shivaji, HSBPVT'S GOI FOP Kashti

Pawar Harshada Navnath, HSBPVT'S GOI FOP Kashti

Nalage Nikita Shivaji, HSBPVT'S GOI FOP Kashti

Ladhane Pratiksha Navnath, HSBPVT'S GOI FOP Kashti

Abstract

A woman's nutritional status during pregnancy and breastfeeding is not only critical for her health, but also for that of future generations. Nutritional requirements during pregnancy differ considerably from those of non-pregnant women. Thus, a personalized approach to nutritional advice is recommended. Currently, some countries recommend routine supplementation for all pregnant women, while others recommend supplements only when necessary.Maternal physiological adaptations, as well as Nutritional requirements during pregnancy and lactation, will be reviewed in the literature examining the impacts of dietary changes. All of these data have been studied deeply to facilitate a discussion on dietary supplement use and the recommended doses of nutrients during pregnancy and lactation. The aim of this review is to evaluate the knowledge in the scientific literature on the current recommendations for the in- take of the most common micronutrients and macronutrient.

Key words- Pregnancy, Physiological Changes, Micronutrients and Macronutrients.

Introduction

Pregnancy

It's crucial consume healthy foods at every phase of life, beginning in the womb. Good nutrition is vital for any gestation and not only helps an expectant mama remain healthy, but also impacts the development of the foetus and ensures that the baby thrives in immaturity and beyond. During gestation, a woman's requirements increase for certain nutrients more than for others. However, babies could suffer from low birth weight(a birth weight lower than 5, If these nutritive requirements are met.5 pounds, which is 2,500 grams), among other developmental problems. thus, it's pivotal to make careful salutary choices.

The first change observed during pregnancy is weight gain. Following recommendations, for a woman with a normal weight (body mass index (BMI) between 19 and 24 kg/m²), gestational weight gain (GWG) should be between 11 and 16 kg. Physiological GWG is mainly due to foetus weight, the placenta, uterus, amniotic fluid, mammary gland, blood, and adipose tissue [1]

Other important changes are cardiac and hematological alterations [2]. Plasma volume in- creases gradually by more than 40% throughout a normal pregnancy. This expansion is greater than the increase in red blood cell mass-there is a decrease in hemoglobin concentration, hematocrit, and red blood cell count. The platelet count decreases at the end of pregnancy, although it usually remains within nor- mal limits. To cope with this increase in volume, cardiovascular adaptation, with peripheral vasodilatation, a decrease in systemic vascular resistance, and an increase in cardiac output of about 40% is observed.

Physiological change in body during pregnancy

Right from the generality, there are originally subtle and latterly on egregious changes in the body that prepare woman to bear a child. Colourful hormones prepare her body for this purpose. Let us now go through colourful changes which takes place during pregnancy.

Changes in Uterus and guts

There's growth and blow up of uterus due to hypertrophy and hyperplasia of muscles. It's followed by stretching of muscle filaments in after part of gestation. Changes in the guts are more apparent in a primigravida. The size of guts increase and nipples come large, erect and deeply painted.

Weight Gain

In normal gestation, variable quantum of weight gain occurs. Woman may lose weight in the early months because of nausea or vomiting. But latterly she starts gaining weight precipitously until the last weeks of gestation.

The total weight gain during gestation ranges from 9- 12 kg.(1 kg in first trimester and 5 kg all in alternate and third trimester). Nutrition during gestation is frequently equated with weight gain because weight is fluently measured. Regular gain in weight is considered the stylish index of a successful gestation. Low weight gain is associated with increased threat of intrauterine growth deceleration(IUGR) and perinatal mortality.

Changes in Body Fluids

During gestation the blood volume is markedly raised(40- 45 above the pre- gestation volume after 32- 34 weeks). It facilitates the increased demand of nutrients by the growing foetus. It also protects mama against the adverse goods of blood loss during delivery.

ENERGY REQUIREMENTS

To ensure that adequate energy requirements are met during pregnancy, the SOGC and the AND have released specific recommendations on kilocalories of intake per day. Therefore, for women who start their pregnancy with a normal body mass index (BMI; range, 18.5-25 kg/m²), no additional food intake is required during the first trimester of pregnancy, whereas calorie intake should be increased by 340 and 450 kcal/d in the second and third trimester, respectively. The RCPI states that energy in- take should be increased to an additional 70 kcal/d in the first, 260 kcal/d in the second, and 500 kcal/d in the third trimester of pregnancy. Hence, the aforementioned guidelines recommend an increase in the daily energy requirements during pregnancy with minor differences in the appropriate calorie intake. Moreover, ac- cording to the SOGC, energy requirements for women who start their pregnancy with an elevated BMI are not well established. Of note is that the rest of the guide- lines make no specific recommendations on this issue.

NUTRITION REQUIRED DURING PREGNANCY

A)Micronutrients

B)Macronutrients

A)Micronutrient Requirements in Pregnancy

Pregnant women’s daily micronutrient intake is determined using the Recommended Dietary Allowances (RDA). The Food and Nutrition Board of the Institute of Medicine (IOM) sets these RDAs, which represent the amounts of essential nutrients that are thought to be enough to satisfy the needs of almost all healthy people. Pregnant women's RDAs have undergone specific changes. The dietary recommendations for a variety of vitamins and minerals during pregnancy are listed in Table 1.

Nutrient	Non-Pregnant	Pregnant
Vitamin A (microgram/d)	700	770
Vitamin D (microgram/d)	5	15
Vitamin E (mg/d)	15	15
Vitamin k (microgram/d)	90	90
Folate (microgram/d)	400	600
Niacin (mg/d)	14	18
Riboflavin (mg/d)	1.1	1.4
Thiamine (mg/d)	1.1	1.4
Vitamin B6 (mg/d)	1.3	1.9
Vitamin B12 (microgram/d)	2.4	2.6
Vitamin C (mg/d)	75	85
Calcium (mg/d)	1,000	1,000
Iron (mg/d)	18	27
Phosphorus (mg/d)	700	700
Selenium (microgram/d)	55	60
Zinc (mg/d)	8	11

Table 1:- Dietary recommendations for expectant mother per day[3]

Iron

Iron is a nutrient of special interest in pregnancy. Many pregnant women, especially in low-income countries, will not meet the requirements [4]and will develop iron deficiency, a condition that increases a risk for preterm birth and LBW.[5] Recent data confirm that maternal anaemia is associated with adverse birth and neonatal outcomes, whereas iron supplementation especially in a multimicronutrient supplement is beneficial for ane- mic pregnant women and their offspring. [6] On the other hand, there is some evidence that higher ferritin levels may increase the risk for GDM. [6] In fact, it has been pro- posed that iron exhibits a U-shaped risk of adverse out- comes in pregnant women, neonates, and infants, and attention should be given to a possible increased risk of adverse outcomes with a higher iron status. [7

The AGDH and the NICE recommend against routine prescription of iron supplements in nonanemic pregnant women. On the contrary, the SOGC and RCPI recommend a daily intake of 16 to 20 mg of elemental iron, the AND suggests 30 mg/d, and the WHO and the FIGO suggest 30 to 60 mg (60 mg is preferred in settings where anaemia in pregnant women is a severe public health problem). For those with a low dietary iron intake and an impaired biochemical status, all the guidelines recommend therapeutic doses of iron to pre- vent adverse outcomes of iron deficiency. The WHO further recommends intermittent 120 mg of weekly iron supplementation for pregnant women to improve maternal and neonatal outcome. Moreover, there is agreement by the AGDH and the WHO related to the effective con- sultation of pregnant women about nutrition, healthy eating, and increase of iron-rich foods' consumption, which may have an integral impact on maternal iron status.

Hence, there is a variation on the recommendations for iron supplementation during pregnancy; this may be related to the fact that the reviewed guidelines reflect different health care policies in the associated regions. In particular, both the WHO and the FIGO are international guidelines, so they refer to both high- and low-income settings, whereas the other medical societies make recommendations for developed countries and populations with probably less iron deficiencies.

Vitamin B9 (Folic acid)

As required by the Food and Drug Administration, folic acid, a synthetic version of the B vitamin folate, is frequently used in nutritional supplements and fortified foods such as bread, cereal, and pasta [8]. Sources of folate-rich foods encompass nuts, liver, citrus fruits, and vegetables. Increased cell division during fetal growth necessitates elevated folate requirements during pregnancy. A shortage of folic acid is frequently brought on by pregnancy, particularly in difficult pregnancies or pregnancies exacerbated by nausea. Before conception, folic acid supplementation (400 800μg daily) can lower the fetus's chance of neural tube disorders such as spina bifida and anencephaly [8]. To reduce the risk of neural tube abnormalities, recommendations include taking folic acid supplements or fortified meals daily in addition to eating a diet high in sources of folate. It is advised that women. Who have previously experienced neural tube abnormalities during their pregnancies take four milligrams of folic acid daily in any later pregnancy Folate deficiency may lead to megaloblastic anemia during pregnancy [9, 10]. Caution is advised regarding excessive folate intake due to potential adverse effects, including certain cancers, medication interactions, and fetal development issues [11]. To prevent different difficulties for both mothers and fetuses, the World Health Organization (WHO) advises oral iron supplements with 30 60 mg of elemental iron per day and vitamin B9 supplements for women who have been diagnosed with iron insufficiency |12, 13].

It is advised to take a daily prenatal multivitamin both before and during pregnancy, the primary distinction is in the amount of folic acid included. A prenatal vitamin's usual composition is outlined in Table 2 below.

Component	Amount	% Daily Value for pregnant and Lactating Woman
Vitamin A	4,000 IU as beta carotene	50%
Vitamin D3	400 IU as Cholecalciferol	100%
Vitamin E	11 IU as dl-Alpha Tocopheryl acetate	37%
Folic acid	800 microgram	100%
Niacin	18 mg as niacinamide	90%
Riboflavin	1.7 mg as Thiamin mononitrate	85%
Thiamin	1.5mg	88%
Vitamin B6	2.6 mg as pyridoxine hydrochloride	104%
Vitamin B12	4 microgram as cyanocobalamin	50%
Vitamin C	100 mg as ascorbic acid	167%
Calcium	150 mg as Calcium carbonate	12%
Iron	27 mg as ferrous fumarate	150%
Zinc	25 mg as Zinc oxide	167%

Table 2:- Standard micronutrient makeup in a Vitamin for pregnancy [3]

Vitamin B6

B-group vitamin deficiencies typically occur alongside each other rather than singularly. Table 2 illustrates that recommended B-group vitamin intakes are higher during pregnancy compared to non-pregnant individuals. These. Increases align with data showing escalated maternal requirements and vitamin deposits in the foetus and placenta [13]. WHO recommends pyridoxine (vitamin B6) to alleviate early pregnancy nausea. Evidence from trials suggests vitamin B6 potentially reduces nausea but exhibits minimal impact on vomiting [14]. Overall, vitamin B6 supplementation isn't generally recommended for improving matemal and perinatal outcomes during pregnancy. Limited evidence suggests potential effects on preeclampsia and moderate evidence for alleviating pregnancy-related nausea [14].

Vitamin B12

Vitamin B12 is essential ise the production of red blood cells, the manufacturing of genetic material, and healthy functioning of the nervous system. The RDA is 2.4 µg/day in nonpregnant women, compared with 2.0 µg/day in pregnant women. Deficiencies in pregnant and breast-feeding wonen may cause neutologic damage in i their children. Deficiency of B12 at the t start of pregnancy may increase risk of birth defects such as neural tube defects and may contribute to preterm delivery[15]. The only natural dietary sources are animal products, including meats, dairy products, eggs, and fish (clams and oily fish are very high in B12), but like other B vitamins. 812 is added to commercial dried cereals and included in adequate amounts in prenatal supplements

Folate

Folate, available also in its synthetic fuem folic acid, is a B vitamin that is used in the manufacturing of neurotransmitters and is particularly important during carly pregnancy because of its essential role in synthesizing DNA in the cells. The RDA for folic acid in nonpregnant women of childbearing age is 400 pag/day and increases to 600 µg/day during pregnancy. Y Good food sources include avocado, bananas orange juice, shy orreal, asparagus, fruits, green leafy vegetables, and dried beans and peas.

In preconception and early pregnancy. 400 µg of folic acid in supplement form appears be adequate for the prevention of neural tube defects, the most common n of which are spina bifida and anencephaly. Spina bifida occurs when there is an incomplete closure of the spinal cord and spinal column and anencephaly is severe underdevelopment of the brain. Neural tulbe defects occur during the first 28 days of pregnancy, usually before a woman even knows that she is pregnant, making the timing of folate supplementation of particular importance. Additional folate introduced after this critical period will not severse prior damage done by a lack of the nutrient [15].

As with other nutrients, the foetus has priority for folate over the mother's needs potentially leasing the mother deficient after delivery unless her intake is sufficient to meet both of their needs. The extra folate in most prenatal vitamins is to prevent the mother from becoming deficient as the pregnancy progresses, both for her own health and to prevent birth defects if a pregnancy occurs within a few months of delivery.

The US. Public Health Service recommended in 1992 that all women of childbearing age consume 400 µg of folic acid daily [16], however, surveys suggested that the overwhelming majority of US, women were not doing so. To deal with the public health crisis of neural tube defects, the Food and Drug Administration mandated folic acid supplementation in enriched grain products. Supplementation, which began in 1998, was estimated to increase the daily folar intake of the average American by approximately 100 μg [17],

Monitoring has shown that fortification has been effective in reducing the incidence of neural nabe defects: they have decreased by 70% in the United States since the program began. Although pre vention of neural tube defects was the primary justification, folic acid fortification has been effective in reducing cardiovascular events as well. During the sarme period, stroke and stroke deaths declined by 15% [18]. Despite concern about potential adverse effects, such as a masking of 812 deficiency, no problems have been identified as a result of the fortification, and controversy mains over whether the level should be increased in the United States to match the model used in Canada and Europe.

Vitamin A

Vitamin A deficiency affects a great proportion of pregnant women, especially those located in Africa and South East Asia, causing night blindness.[19]However, scientific evidence has linked the excess consumption of vitamin A during pregnancy, either through diet or in the form of vitamin supplements, to an increased risk of congenital malformations [20]. Thus, vitamin A intake should be monitored during pregnancy, so that it does not exceed the beneficial dose and cause harm to the developing foetus. There is some encouraging evidence that neonates from mothers with deficiency in vitamin A, who are exposed to vitamin A supplementation during pregnancy and at birth, do not present with adverse outcomes in childhood, as their general intelligence and their memory is not affected; in fact, school performance is improved in those who received vitamin A both in utero or at birth.[21] How- ever, consumption of high doses of vitamin A supplements seems to be teratogenic.[22]

Therefore, the AGDH and the WHO clearly state that regular vitamin A supplementation is not recommended, and prescription should be limited only to populations who demonstrate deficiency. The WHO, in particular, encourages vitamin A consumption to be based on adequate nutrition and highlights the uncertain safety of a single dose of a vitamin A supplement greater than 25,000 IU. Especially when consumed between day 15 and 60 from conception, vitamin A may be teratogenic.

Vitamin D

Vitamin D may be obtained through diet and supplements or can also be made by the body when skin is exposed to ultraviolet rays. Vitamin D is necessary to help build and maintain strong bones and teeth and is very important during fetal development for this reason. Recent research shows that babies born during the late summer and early fall are taller and have wider bones [23]. There is also mounting evidence that vitamin D plays a key role in preventing common cancers, autoimmune diseases, type 1 diabetes, heart disease, and osteoporosis. Furthermore, studies have shown that vitamin D deficiency is com- mon in the United States, suggesting that most Americans would benefit from supplements [24]. Fatty fish (mackerel, sardines, salmon), liver, egg yolks, and fortified milk are all good dietary sources of vitamin D. Vegans, women with lactose intolerance or milk allergies, women who dislike dairy products, and women who avoid the sun may be at particular risk for vitamin D deficiency. The RDA for vitamin D in pregnant and nursing women is currently 200 IU (5 μg/day), although this is considered much too low by experts in the field. Michael Holick, MD, PhD, one of the leading researchers on vitamin D, recommends 1,000 IU daily for everyone over the age of 1 year. Alternatively, if the latitude provides ad- equate year-round ultraviolet light, vitamin D needs can be met by exposure of the arms and legs to sunlight for 5 to 10 minutes three times a week. Women in the United States living north of Atlanta, Georgia; women with darker skin tones; and women who use a lot of sunblock or who limit their sun expo- sure should be strongly advised to supplement with additional vitamin D beyond that provided by the prenatal supplement.

Vitamins C and E

Vitamins C and E act as antioxidants, countering the impact of free radicals, and are commonly found in fruits and vegetables [25,26]. Based on data from two comprehensive Cochrane reviews that included 17 studies from various high-income countries, the WHO does not advise pregnant women to take vitamin E or C supplements to improve the outcomes of pregnancy and delivery . Notably, strong evidence links vitamin C and E supplements to the Increased likelihood of experiencing stomach pain during pregnancy [27,28]

Calcium

Calcium participates in the mineralization of the fetal skeleton, especially during the third trimester. The skeleton of a full-term baby contains approximately 30 g of calcium, and three- quarters of this mineral content is deposited during the last trimester of pregnancy. As a result, maternal calcium needs to increase, especially from the third trimester (the need for calcium varies from 1000 to 1200 mg/day) [12 ,29]

To meet these increased needs, the intestinal ab- sorption of calcium increases very early in pregnancy. In addition, the vitamin D supple- mentation recommended in the seventh month of pregnancy in some cases (see below) pro- motes this intestinal absorption of calcium. Low calcium intake can worsen the severity of last- trimester bone loss and the risk of developing pre-eclampsia.

Calcium supplementation is only recommended by the WHO for low calcium intake populations to reduce the risk of pre-eclampsia.The WHO indicates that calcium can be used for the relief of pregnant women's leg cramps. The WHO Guideline Development Group(GDG) agreed that calcium and magnesium are doubtful to be dangerous in the cure schedules estimated in the studies they reviewed(i.e., the studies by Zhou et al.(30), Hammar et al.(31,32), and Sohrabvand et al.(33)). Still, the GDG specified that farther exploration into the etiology and frequence of leg cramps in pregnancy, and the part(if any) of magnesium and calcium in symptom relief, is demanded(13).

In addition to the WHO recommendations, two studies have published the results of calcium supplementation during gestation.

• O'Brien et al.(34) stressed that inputs of salutary calcium.

• A recent Cochrane review(35) on the goods of calcium supplementation during gestation in precluding hypertensive diseases and affiliated problems has linked 24 studies that estimated the goods of high- cure supplementation(≥ 1000 mg/ day versus placebo) or low- cure supplementation

In populations with low calcium intake, daily supplementation (1.5-2.0 g of elemental calcium) is recommended for pregnant women to reduce the risk of pre-eclampsia [34]. Evidence of the effects of calcium supplementation on outcomes other than hypertension/pre-eclampsia was obtained from a systematic Cochrane review [36].

Magnesium

Magnesium is an essential mineral that is required for several processes of the body, and adequate maternal levels in pregnancy may reduce fetal growth restriction and pre- eclampsia, as well as increase birth weight. [37]According to a recent randomized controlled trial, magnesium supplementation in pregnant women with hypomagnesaemia improved several pregnancy outcomes (fetal growth restriction, preterm labour, maternal BMI, neonatal weight, pregnancy-induced hypertension, preeclampsia, GDM, leg cramps) compared with the other groups, suggesting that hypomagnesaemia might be a risk factor for complications during pregnancy. [38]As already mentioned, there is evidence that cosupplementation of magnesium and vitamin E might be beneficial for GDM, as it has been shown to improve glycaemic control and lipid profiles. [39]The AGDH and WHO guidelines state that there is insufficient evidence to conclude whether dietary magnesium supplementation during pregnancy is beneficial, and there is low certainty that a nonpharmacological treatment of magnesium and calcium may relieve pregnancy cramps. Of note, the other guide- lines make no specific recommendations for magnesium

Iodine

Maintaining thyroid homeostasis is crucial for brain development, learning, and intelligence acquisition, particularly In expectant mothers and infants. Natural iodine sources in the diet include fish, seafood, and dairy products, along with fortified or high-iodine additions like cooking salt [40,41]. However, pregnant women are advised to refrain. From specific fish and seafood types due to the elevated risk of contamination. Iodine requirements surge by approximately 50% during pregnancy, attributed to fetal thyroid hormone synthesis, increased renal iodine clearance, and maternal thyroid stimulation by hCG, starting in the second trimester. The WHO recommends 220 250 µg of iodine daily for expectant mothers [12]. Certain scenarios heighten pregnant women's risk, such as residing in iodine-deficient areas, smoking, having closely spaced pregnancies, following specific diets (e.g.. vegetarianism), and experiencing nausea and vomiting, which reduces food intake [42]

Zinc

Zinc is essential for numerous natural processes including, for illustration, cell division, protein conflation and growth, and nucleic acid metabolism. During gestation, zinc scarcities may lead to natural deformations, low birth weight, intrauterine growth deceleration, and preterm delivery[43]. The zinc conditions of pregnant women are slightly increased(11 mg/ day)(see Table 1); still, zinc is substantially present in meat, fish, and seafood. As similar, food input alone may, thus, be inadequate during gestation. Zinc insufficiency is common worldwide, particularly in developing countries. In European countries, there's no severe deficiency[44]; still, pregnant women should cover their salutary input because tube zinc attention is an important determinant of gestation issues[45]. Zinc supplementation in pregnant women is only recommended as part of rigorous exploration and with environment-specific recommendations.

Evidence was obtained from a Cochrane review, which included 21 trials involving more than 17,000 women [46]. The Cochrane database re- ported a 14% relative reduction in preterm birth with zinc supplementation compared to a placebo group. However, the authors noted that these results were obtained primarily in studies of women from low-income households and this has some relevance in areas of high perinatal mortality. In addition, they noted that there was not enough evidence to show that zinc supplementation in women results in other clinically relevant outcomes [46].

Moreover, pregnant women taking iron supple- mentation should be even more vigilant because it has been shown that iron decreases zinc ab- sorption. However, this effect is only observed with high concentrations of iron and when zinc and iron are given in solution.

Thus, it is ad- vised that iron supplements should be taken be- tween meals [47]. In addition, zinc increases the absorption of dietary folates and thus contributes to the prevention of folate deficiencies.

B)Macronutrients required during pregnancy

PROTEIN

Due to adaptations in protein metabolism during pregnancy [48], the synthesis of protein in pregnant women is increased and protein is stored in the foetus, placenta, and maternal tissues. Similar to fat, recommendations for protein intake are expressed as a percent of total energy for protein; the IOM recommends 10% to 35% of total energy from protein.

Many studies have examined protein requirements during pregnancy, based on estimations of the total amount of protein deposited and nitrogen balance studies. The IOM recommends no additional intake of protein for the first half of the pregnancy, as the metabolic adaptations are thought to compensate for increased needs. During the second half of the pregnancy, the IOM set the estimated average requirement (EAR) at 0.88 g/kg/day and the RDA at 1.1 g/kg/day. In 2007, a WHO/ Food and Agriculture Organization (FAO)/United Nations University (UNU) Expert Consultation concluded, based on the estimated efficiency of protein utilization and an addition gestational weight gain of 13.8 kg, that during the first, second, and third trimesters of pregnancy, an additional 1 g, 9 g, and 31 g protein per day are required, respectively [49]. Despite this higher need, caution should be taken in increasing intakes beyond recommendations.

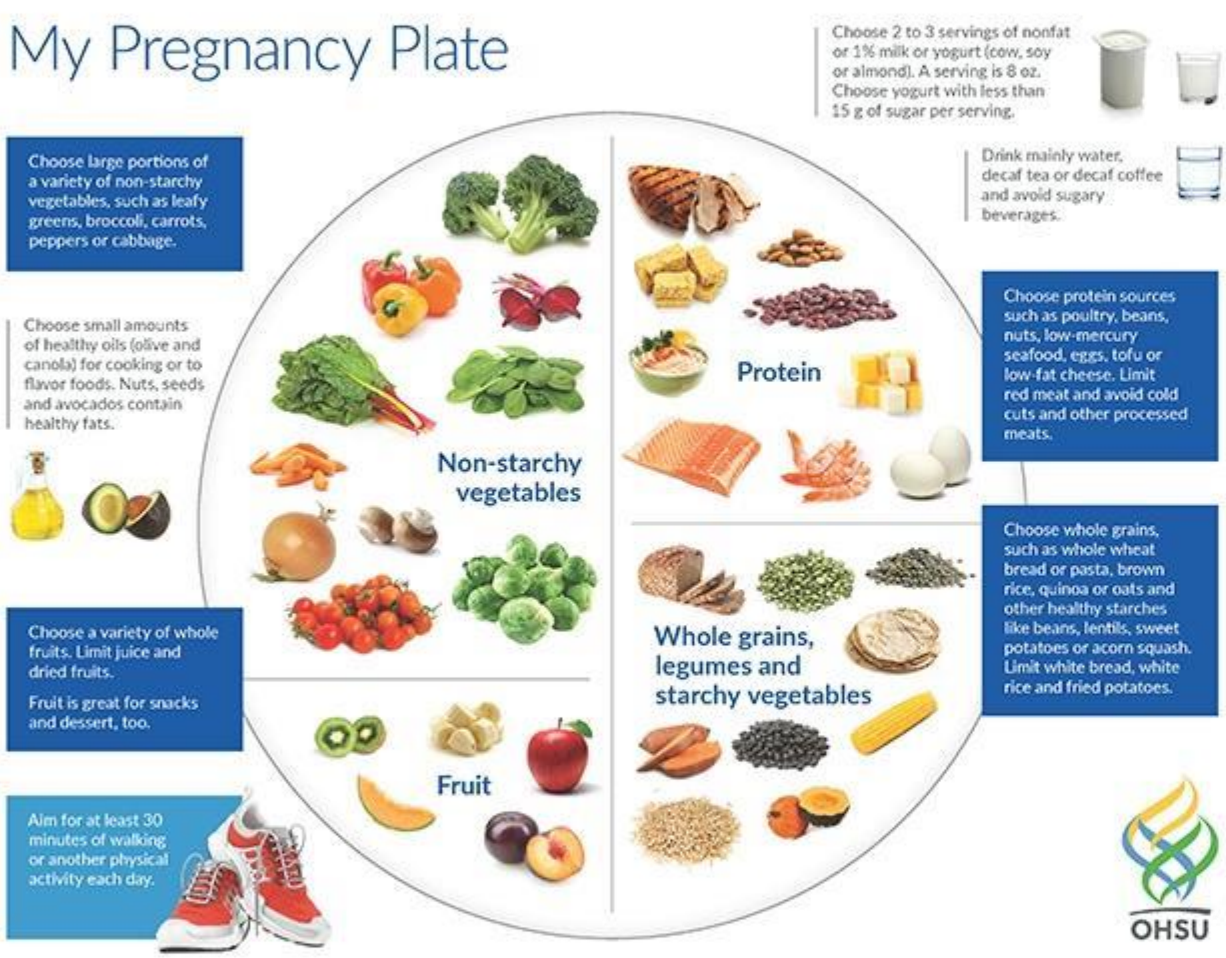
CARBOHYDRATES

Carbohydrates are the primary source of energy for the cells of the pregnant women and the foetus. Glucose is the main source of energy for the brain, and the carbohydrate requirements of pregnant women are based on the estimated additional glucose needed for fetal brain development. Carbohydrates can be classified by their glycemic index (GI). Diets rich in low GI carbohydrates have been proposed to help prevent obesity-associated diseases, such as type 2 diabetes and coronary heart dis- ease [50]. Studies with pregnant women have shown that a low Gl diet can, among other things, prevent excessive gestational weight gain, improve glucose tolerance and, in the extent to which low Gf foods are more likely to be rich in micronutrients, increase their intakes [51].

As for the general population, the IOM recommends that, for pregnant women, carbohydrates should provide 45% to 65% of the total energy. The IOM set the EAR for pregnant women at 135 g/day and the RDA at 185 g/d, based on the amount of carbohydrate on the EAR for the women, plus the amount of glucose needed for the fetal brain. Due to limited evidence, there are currently no specific recommendations for carbohydrate intake for obese women. However, low GI diets have been shown to prevent excessive weight gain, as well as increase weight loss after delivery [52] In women with gestational diabetes, a low GI diet has been associated with lower insulin use and lower postprandial glucose levels [53]

Lipids and Fats

The mother-to-be maat include enough fat in her dirt to meet the needs of her growing baby. Lipids,Including sterols, phospholipids, and triglycerides, which are primarily made up of fatty acids, are an other basic building material of body tissue and integral to body functioning. Lipids are essential for the formation of cell membranes and hormones and are necessary for eyeand brain de velopment , especially during the prenatal period and into the first few years of the child's life [54]Fat is abo a source of concentrated calories and may be beneficial to women at risk of energy mal- nutrition while pregnant. Women who are not at risk should avoid excess fat because it can easily lead to undesired weight gain; moderation is essential. There is no separate RDA/DRI for fat intake during pregnancy, and the recommendation remains 20% to 35% of total calories, the same as for the general population. Fat intake during pregnancy should emphasize sources that provide the essential fatty acids And choline, a component of phospholipids necessary for healthy begin function.



Conclusion:-

Nutritional needs must be significantly adjusted during pregnancy due to the unique physiological state of pregnancy, which supports both the health of the mother and the development of the child. Micronutrients, such vitamins and minerals, plus omega-3 fatty acids are indispensable for achieving the best possible pregnancy outcomes since they affect both the developing fetas's health and that of the mother. Crucial micronutrient that affect fetal growth, neural development, and general maternal health during gestation include iron, calcium, magnesium, iodine, zinc, and folic acid. Furthermore, dietary counseling becomes apparent as a vital part of prenatal care, providing pregnant mothers with priceless assistance. Maternal nutrition education programs have demonstrated beneficial effects flects on gestational weight growth and pregnancy outcomes, highlighting the significance of incorporating autritional counseling into standard prenatal care.

Nevertheless, even with the importance of a healthy diet, maternal malnutrition is still a major problem in the world. Particularly in some arras, necessitating further efforts to address this problem in its entirety. This article emphasizes the complex connection between maternal nutrition and the course of the pregnancy. Ensuring optimal maternal fetal health and fostering favorable outcomes for both mother and child throughout pregnancy requires adequate micronutrient intake, balanced macronutrient consumption, and easily available nutritional counseling.

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