



The Role Of Nutraceutical Pregnancy

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Abstract

In life, nutrition is really important at all times. It also happens during pregnancy, and for good reason. Not Only Should the growing offspring have enough nutrients, but the mother's body should also receive adequate nourishment. Pregnancy Nutrition directly affects the health of the mother and the fetus. Ideal fetal growth is guaranteed by optimum nutrition. Additionally, it guarantees a lower chance of contracting illness later in life, particularly chronic non-communicable diseases. Reviewing the dietary needs during pregnancy and emphasizing the negative effects of inadequate consumption are the objectives of this article. Healthy diet in pregnancy should ensure proper fetal growth, good maternal health and lactation. Good fetal supply is also achieved through increased intestinal absorption or reduced excretion via the kidney or gastrointestinal tract. Nutritional counseling and interventions need to be an integral part of antenatal and pregnancy care. This review offers information to assist health professionals with advising pregnant women of the important nutrition considerations during pregnancy. The roles of some of the key nutrients are discussed, including folate, iodine, iron, calcium, and vitamin D.

Keywords. Nutrition , gastrointestinal tract , protein , fetus growth

1. INTRODUCTION

Nutritional requirements of pregnant women are essential and must be provided and considered during pregnancy. Good nutrition during pregnancy is essential to the health of pregnant mothers and their fetus. Pregnant women have certain nutritional needs that must be met and taken into consideration. Healthy eating is crucial for both the health of expectant mothers and their developing fetus. Pregnancy-related dietary consumption needs to be taken into account for the mother's health. A healthy diet that includes the four nutritious and five ideal food groups should be consumed by pregnant women. Dependence of health, growth, and development on the amount and caliber of nutrients ingested. The mother supplies all the nutrients needed for the child's development during pregnancy. During pregnancy, the fetus's life support system develops and increases. Sufficient nourishment is necessary for pregnant women's development, and health on the quantity and quality of nutrients consumed. During pregnancy, the mother provides the child's development with all

nutrients. The life support system of the fetus grows and develops during pregnancy. Pregnant women require adequate [4,3]

nutrition for the growth and development of their fetus; thus, a varied food is required to meet the nutrient requirements of these foods

The number of vitamins during pregnancy, nutritional needs increase. Pregnant women gain weight during their pregnancies due to physiological changes that occur during pregnancy, such as increased plasma volume, increased food reserve supply, increased uterine blood flow, increased fetal weight, amniotic fluid, and placenta. The typical female weight gain will be 12.5 kg. Prenatal nutrition begins in the first, second, and third trimesters of pregnancy. This is necessary to ensure that pregnant women can give birth to healthy, normal-weight babies and that their pregnancies can proceed normally and securely. The consumption of vitamins and minerals is one of the nutritional

requirements that must be modified during pregnancy (Autoridad Nacional del Servicio. The requirements of Nutritional supplements increase during the pregnancy. The requirement of certain supplements is very necessary for the growth and development of fetus such as folic acid, iodine, iron and copper. In order to prevent the deficiency of certain nutrients, most of the medical specialists recommend or prescribe prenatal supplements. The nutritional intake of pregnant women is driven by a variety of internal and external factors, including low levels of knowledge, social factors, and household income

- A household's income has a significant impact on the amount and quality of
- food (McDonald et al., 2020). A large income affords a greater choice of food of greater
- quality and quantity. Because it is directly proportionate to the purchasing power of the
- family, family income has a role in determining the health state of a person, especially
- pregnant women. Depending on their monthly income, families can afford to purchase
- groceries. The larger the income, the greater the expenditures. Carbohydrates & Fiber

Categories based on natural source. [4]

Carbohydrates & Fiber Fat & Essential fatty acids

Protein

Minerals like Macrominerals & Trace minerals

Vitamins

Water

Caffeine

Zinc

Probiotics

Magnesium, Choline and iodine Folate Other nutrients like Antioxidants, Phytochemicals & Intestinal bacterial flora Recombinant nutraceutical

Concept of Nutraceuticals

New concepts such as nutraceuticals,

nutritional therapy, phytonutrients, and phytotherapy have emerged with this phenomenon. These active or therapeutic foods and phytonutrients or phytomedicines play a positive role in improving health and immune function to prevent diseases, as well as promising to minimize side effects and maintaining ideal health.

Today we recognize the wisdom of the often-quoted saying of the Greek physician Hippocrates, made almost 2500 years ago, "Let food be thy medicine and medicine be thy food". These products are classified as functional foods, dietary supplements and nutraceuticals "any material that may be considered a food or part of a food and that offers health and medical benefits including disease prevention and treatment". Perhaps the most descriptive term used to refer to this category is "nutraceuticals."

[1]

2 CONCEPT OF NUTRACEUTICAL

Nutraceutical the food of part health and benefits in body prevention treatment of disease and disorder the term nutraceutical is coined by combining the terms Nutrition and pharmaceutical nutraceutical also various synonyms like this function food ,dietary supplements , designer food ,medical food,phytochemicals The term nutraceutical was introduced in 1989 by American medical doctor Stephen L. DeFelice. NutraceuticalThe word “nutraceutical” blends the term “nutrient” with “pharmaceutical” (a prescription drug). Nutraceuticals may contain substances that are expressed as “natural” intention to treat or prevent disease but may not generally be recognized as safe of pregnancy

Despite the widespread misconception that "eating for two" is appropriate, this is untrue. All the mother needs to do is eat a bit more than she often does. Nonetheless, the mother's diet should be rich in nutrients, sufficient to support both her developing fetus and her milk for future breastfeeding (Surbhi jainIP Journal of Nutrition, Metabolism and Health Science, October-December, 2019;6(4):108-112)[5]

Balnce diet during in pregnancy

Food group	quantity in taken pregnancy
Fruit	200
Leafy and green vegetables	150
Milk	500

3 ENERGY OF MICRONUTRIENTS

The daily energy requirement for stability of normal-weight women with relatively active lifestyle is increased if she is expecting child depending upon the pregnancy stage. A good balance of macronutrient is achieved by slightly increasing energy intakes within the dietary guidance recommendations. In addition, especially in obese and overweight women with increased risk of miscarriage, pre-eclampsia, gestational diabetes, as well as type 2 diabetes and obesity also resulted by excess calories and macronutrients intake during pregnancy may be just as damaging as their deficiency (Bruce 2014; Catalano and Demouzon 2015). Hence mother’s requirement during lactation for milk production is moderately increased. The Italian recommended dietary allowance in 2014 suggested a rise in calories as per requirements for a total of 76,530 kilocalories during the first trimester and additional requirement of 69 kilocalories per day. Similarly, 266 kilocalories per day and 496 kilocalories per day for the second trimester and the third trimester of pregnancy is required [1]

Protein

During maternal tissue and fetal development, protein synthesis demand increases and macronutrient such as protein needs more considerations during pregnancy, especially during the third trimester. Negative effect on health in term of weight and length at birth time is associated with unnecessary low protein intake while on the other hand, fetal development is also affected by high protein level (Protein Digestibility Corrected Amino Acid Score (PDCAAS) is the digestibility score for amino acid which is used to calculate the protein value (Schaafsma 2000). Animal product values are close to 1 typically together with all nine essential amino acids, while plant values range below 0.7. However, to improve the overall quality of protein, its better to take two or more vegetable foods with different amino acid compound Hence, increase in protein intake during pregnancy is another important step of International guidelines, especially during the second and third trimesters is important for maternal and fetal tissues and placenta and also ensure they will gain additional 21 grams). The increase of 1 gram per day recommended daily allowance (RDA) during the first trimester of pregnancy and 8 gram per day in the second trimester and in the same manner for 26 gram per day in the third trimester (sadia . Hasan 60)If breast milk is already a significant proportion of the infant's diet, then, the normal consumption of protein during exclusive breastfeeding should be 21 gram per day in the first semester and 14 gram per day later



Carbohydrates

Carbohydrates are the main source of energy for the body, and most particularly for the brain. Pregnant women need the carbohydrate energy to grow a healthy baby, as carbohydrate-derived glucose is the main fuel used to grow intrauterine (Clapp 2002). The recommended daily intake (DRI) during pregnancy for carbohydrates is 175 g/d. It is important for pregnant women to choose high-quality carbohydrates with a low glycemic index (GI), naturally found in whole foods such as whole grains, bananas, beans, peas, lentils, and low-fat dairy (Clapp 2002). Carbohydrates

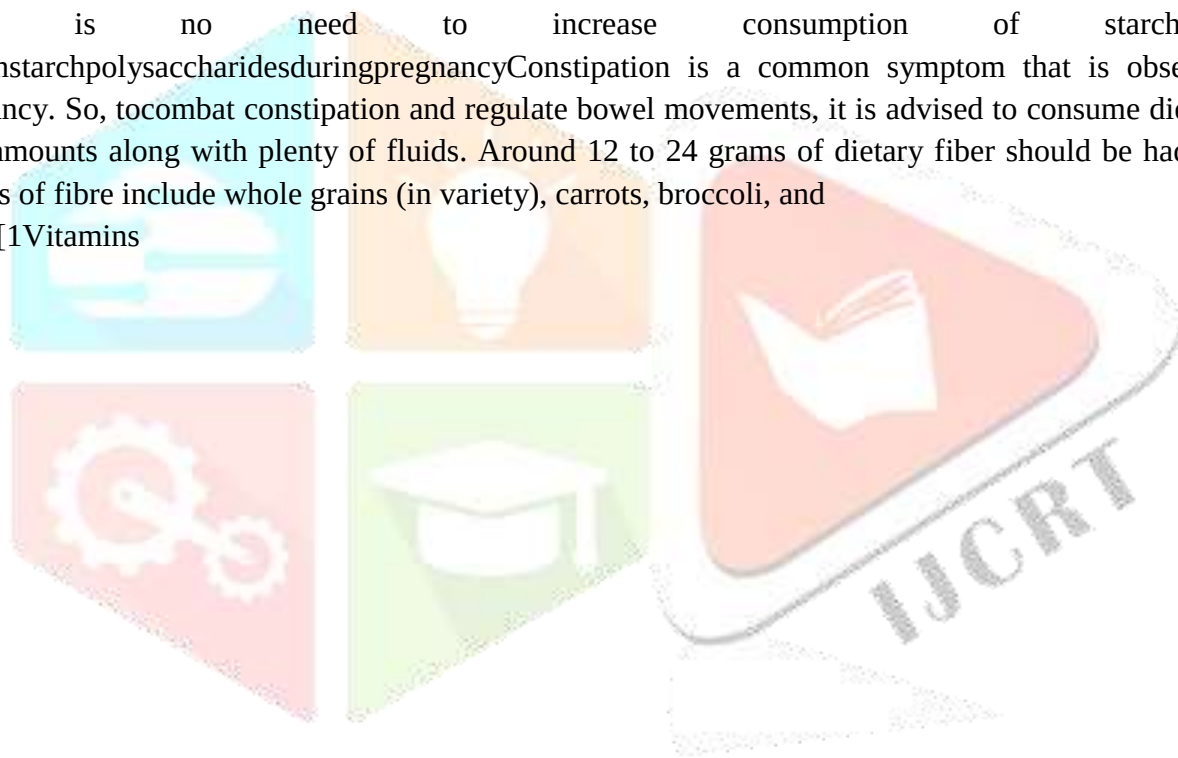
may also take the form of additional sugars such as table sugar, honey, syrup, cane sugar, agave, high-fructose corn syrup, and concentrate of fruit. The recommendations of 0.88 and 1.1 g · kg⁻¹ · d⁻¹, respectively, are for all stages of pregnancy. The single recommendation does not take into account the changing needs during different stages of pregnancy. An additional protein intake of 15g/day i.e. a total of 65g is recommended.

T: Portion Size of Food and Nutrient Content Food groups g/portion Energy (k

5.0 *Toned milk Source: Dietary guidelines for Indians- a manual, NIN, ICMR, 1999. Fat and essential fatty acids .Fats are necessary for structural and metabolic functions as well as for the transportation of fat soluble vitamins. Nuts, vegetable oil, seeds and oily fish are excellent sources to have good fats from. Even though there is now such recommendation so as how much fat pregnant women should have, it is advised that they have them in adequate amounts. ICMR expert committee has suggested an intake of [1]of visible fat/day during pregnancy. It is important for omega-3 fatty acids to be supplied to the fetus in adequate amounts throughout pregnancy. To optimize pregnancy outcomes and fetal health, consensus guidelines have recommended that pregnant women consume at least 200 mg of DHA per

Carbohydrates

There is no need to increase consumption of starch, sugar and nonstarch polysaccharides during pregnancy. Constipation is a common symptom that is observed during pregnancy. So, to combat constipation and regulate bowel movements, it is advised to consume dietary fiber in good amounts along with plenty of fluids. Around 12 to 24 grams of dietary fiber should be had daily. Good sources of fibre include whole grains (in variety), carrots, broccoli, and beans.[1] Vitamins



	Vitamin A	Beneficial in treating eye disorders, skin infections
	Vitamin B9	Reduces risk of neural tube defects during pregnancy
	Vitamin B12	Provides relief from symptoms of anemia, kidney and liver disorders
	Vitamin C	Helps treat scurvy, cancer and common cold
	Vitamin D	Aids in treating arthritis, tooth decay, diabetes and rickets
	Vitamin E	Improves blood circulation and slows down aging process
	Vitamin K	Reduces risk of menstrual pain and internal bleeding

The need for each type of vitamin is discussed below:

Vitamins A - Increased use of this vitamin is advised during pregnancy, particularly in the third trimester. The mother's vitamin A intake should be adequate for the foetus's healthy growth and maintenance as well as the growth of the mother's tissue. Small doses of vitamin A are sufficient, thus consumption shouldn't be raised significantly. A retinol-based vitamin A consumption that is out of balance may be harmful to the developing foetus. There is no harm associated with consuming excess vitamin A in the form of carotenoids. Carrots and sweet potatoes are good sources of carotenoids. Nutraceuticals' Place in Mother Nutrition Neelam Faiza, Sadia

Hassan, [1] especially those located in Africa and SouthEast Asia, causing night blindness. 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. Thus, vitamin A intake should be monitored during pregnancy, so that it does not exceed the beneficial dose and cause harm to the developing fetus. 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. However, consumption of high doses of vitamin A supplements seems [3,4]

Vitamins C

Furthermore, the recommended for a typical adult woman, 40mg/day, contains a margin of important during pregnancy for iron absorption, and hence, inadequate intake has been related with both anemia and ischemia. Furthermore, the 40 mg daily dose for an average adult woman includes a safety margin. As a result, the ICMR does not recommend taking supplemental vitamin C during pregnancy. As a result, pregnant women should drink a suitable amount of vitamin C, as well as somewhat more of it. Oranges, lemons, strawberries, melons, mangoes, kiwis, cantaloupe, and pineapple all have high levels of vitamin C. Pregnant mothers who are vitamin C deficient may cause brain harm to their growing child. (1) Because of its water solubility and the inability to be synt4]. and Vitamin C, which cannot be generated internally, is an essential nutritional component. Furthermore, poor vitamin C intake has been associated to both ischemic anemia and anemia during pregnancy, as it is required for iron absorption. placental disease.41 Nonetheless, according to AGDH and WHO guidelines, vitamin C supplementation is not suggested for pregnant women because an excessive amount might be harmful. The other guidelines offer no explicit recommendations on this Nutrient

[4]

Vitamins D

Food items that contain vitamin D include eggs and fatty salmon. However, it is ideal to get your Vitamin D from sunlight. It is critical to maintain enough Vitamin D levels during pregnancy to enable normal calcium absorption and use, as well as calcification of the fetal skeleton. It is also necessary to consume sugar in the form of candies, cookies, and sugar-sweetened beverages. Loy et al. discovered that eating more fruits and vegetables was linked to higher levels of birth. *IPJournalofNutrition, Metabolism and Health Science, October-December* [1]

Vitamin D is a fat-soluble vitamin that can be obtained through natural sources, such as fatty fish, but can also be synthesized in the skin with the effect of sun's ultraviolet [1] radiation. Vitamin D deficiency and insufficiency are common in pregnant women and keeping a normal maternal vitamin D status may improve perinatal outcomes. Especially, a recent systematic review of vitamin D supplementation in more than 5000 pregnant women found that supplementation was associated with a lower risk of birth of a small for gestational age (SGA) neonate and did not increase risks of fetal or neonatal mortality. ³⁵ Another systematic review and meta-analysis of randomized trials found that there is a beneficial association of prenatal vitamin D supplementation, perinatal vitamin D status, and offspring's birth weight. ³⁶ However, there is insufficient evidence for a definite association of vitamin D supplementation with maternal health conditions related to pregnancy and the postnatal growth of the infant. Recommendations on vitamin D supplements during [4]

Folic acid

The body uses folic acids (folates, vitamin B9) for a number of metabolic processes, including the methylation of homocysteine to methionine, the creation of DNA and RNA, and the metabolism of amino acids. In actuality, metabolized folic acid forms function as transport coenzymes that facilitate the efficient transfer of carbon units across different compounds. Folic acids are therefore seen as beneficial, and a lack of them can result in megaloblastic anemia, *th* [1]

Calcium

During pregnancy the need increases to 1000mg/day. To maintain bone mineral density and bone mass, calcium is needed. Pregnant women have an increased need for calcium. Placenta does the work of transportation of calcium. By the time a woman is in the 20th week of her pregnancy, calcium levels are higher in the foetus than in the maternal plasma. The calcium needs of a lactating woman are also high. Best sources of calcium are milk and milk products, followed by green leafy vegetables. Enough calcium intake reduces the risk of preeclampsia. Calcium deficiency can also give rise to various complications in the growing foetus

Iron

The daily requirement for iron increases to 38 mg during pregnancy from 30 mg. The reason for the increased requirement of 8 mg/day is the development of the fetal liver's iron storage, which will persist for at least 4-6 months after birth, and the expansion of maternal tissues, including red cell mass. This is the outcome of the baby's first feeding milk having too little iron in it. Newborns typically contain 18–22 grams of iron for every 100 milliliters. Because their bodies must provide the fetus with blood and oxygen due to the mother's increased

blood volume, pregnant women require significantly more iron. Iron is almost twice as important to pregnant women as it is to non-pregnant ones. lady. One of the many nutrients that pregnant moms should eat is green leafy vegetables[2]. To meet their daily iron needs, eat seeds, beans, lentils, beets, and dried fruits and nuts. Iron supplementation is advised if necessary. Iron deficiency can lead to anemia, preterm birth, and low birth weight. Pregnancy's growth and development may also be impacted by inadequate iron consumption (IP Journal of Nutrition, Metabolism and Health Science, October–December, 2019;6(4):108–112).[2] 1.

Folate

Pregnant women are recommended to have folate supplements. Folic acid can prevent birth defects such as spina bifida. This B group vitamin is necessary for proper growth and development. Naturally found in green leafy vegetables and citrus fruits, its supplements are also recommended to pregnant women. The recommended dose of folic acid is 400 mcg per day. It is 600 mcg from months four to nine and 500 mcg while breastfeeding. This vitamin is also required for DNA replication. Its deficiency can cause anaemia in the mothers and congenital abnormalities in the foetuses.[1]

Magnisum

Magnesium is a necessary mineral for many bodily functions. Enough maternal intake during pregnancy can lower preeclampsia and fetal growth limitation while also increasing birthweight.⁵³ A recent randomized controlled trial found that pregnant women with hypomagnesemia who received magnesium supplementation experienced improvements in a number of pregnancy outcomes when compared to the other groups. These outcomes included leg cramps, preterm labor, maternal BMI, neonatal weight, pregnancy-induced hypertension, preeclampsia, and GDM. These findings raise the possibility that hypomagnesemia is a risk factor for pregnancy-related complications.⁵⁴ Evidence suggests that co-supplementing with magnesium and vitamin E may be advantageous for GDM, since it has been demonstrated to enhance[4]

Polyunsaturated fatty acid

The primary polyunsaturated fatty acid present in the human brain and retinal rods is essential for the development of the fetus's brain and retina throughout pregnancy. During the first month of life, when supplied in significant quantities through breast milk, docosahexaenoic acid (DHA) is essential for neurodevelopment and psychomotor skills. The fetus and newborn benefit from its development (Sadia Hassan. DOI:10.1007/978-3-030-42319-3_24). [1] The role of maternal nutrition (pp. 527–541) in the book Functional Foods and Nutraceuticals. Omega-3 fatty acids can reduce the risk of an immature delivery in addition to having a major effect on maternal health. DHA also reduces the risk to a baby's overall health. The human body produces DHA through enzymatic activities utilizing alpha-linolenic acid (ALA), a metab.

Fatty acids

Lipids and vital fatty acids During pregnancy, an ICMR expert committee recommends 30g of visible fat per day. Throughout pregnancy, it's critical to provide the fetus with sufficient levels of omega-3 fatty acids. It has been suggested by consensus standards that pregnant women should take at least 200 mg of DHA each day to optimize pregnancy outcomes and fetal health. Fats are necessary for metabolic and structural functions, as well as for the transfer of fat-soluble vitamins. Nuts and seeds (October–December 2019; IP Journal of Nutrition, Metabolism and Health Science, 6(4):108-112) Healthy fats can be found in abundance in fatty seafood and vegetable oil. Pregnant women are encouraged to have an appropriate quantity of fat, even if there is no longer a suggested amount.[1]

Choline and iodine

Due to their critical roles in the development of the fetal brain, iodine and choline are required in much higher amounts during pregnancy.⁶⁴ As a result, the RCPI, the AGDH, the SOCG, and the FIGO advise consuming enough choline and iodine when pregnant, while the FIGO suggests iodine supplementation in situations where a sizable section of the population lacks access to iodized salt. To be more precise, the AND and SOCG advocate for foods high in choline and iodine, while the AGDH recommendation suggests taking an iodine supplement of 150 µg/d, albeit people with previous thyroid disease should use caution when taking this supplement. (Nutrition in Pregnancy[4])

Caffeine

The most popular psychostimulant in the world is caffeine. Although it can be produced and added to foods, beverages, nutritional supplements, cosmetics, and medications, it can also be found naturally in coffee beans, tea leaves, cocoa beans, and kola nuts. Since excessive consumption during pregnancy is associated with fetal growth restriction, preterm birth, stillbirth, risk of pregnancy loss, and low birth weight (LBW), it may have adverse effects on maternal, fetal, and neonatal outcomes. Therefore, in order to reduce the risk of pregnancy loss and low birth weight babies, the World Health Organization advises women who drink more than 300 mg of caffeine daily when not pregnant to cut back on their intake during pregnancy. In a similar vein, the SOGC specifies the sources of caffeine and suggests that daily consumption be restricted to 300 mg, 700 mL instant coffee, or 1400 mL of leaf or bag tea. According to the RCPI and AND, consuming less than 200 mg of caffeine per day does not lead to negative perinatal outcomes. Finally, the AGDH informs women that small to moderate amounts of caffeine are unlikely to have a harmful impact on delivery outcomes. The difference in the upper limit of caffeine consumption could be attributed to the publication year of each guideline. Specifically, following the publication of a 2017 systematic study, which indicated that daily caffeine consumption 700 mL instant coffee, or 1400 mL leaf or bag tea. The RCPI and the AND state that consumption of caffeine less than 200 mg/d is not associated with adverse perinatal

outcomes. Lastly, the AGDH reassures women that small to moderate caffeine consumption is unlikely to negatively affect birth outcomes. The variation in the upper limit of caffeine consumption may be related to the publication year of each guideline. In particular, after the publication of a 2017 systematic review, which concluded that a daily caffeine consumption

up to 300 mg, in healthy pregnant women, is not associated with adverse effects,⁷² this limit seems logical to be adopted.[2020 Wolters Kluwer Health, Inc.][5]

Probiotics

There is some evidence that the mother's gut, vaginal, and placental microbiome may have an impact on pregnancy complications and newborn health. Particular research suggests that probiotic supplementation may have a preventative impact against preeclampsia, gestational diabetes mellitus, vaginal infections, maternal and newborn weight gain, and allergic diseases.⁶⁵ It's worth noting that a 2018 study on moms' use of probiotic-containing foods found a relationship between preterm birth risk and prenatal yogurt consumption. According to the study, probiotic components in yogurt may lessen the risk of premature delivery by lowering inflammation and infection responses, both of which can lead to preterm birth.⁶⁵ Furthermore, a recent meta-analysis indicated that probiotic supplementation during pregnancy improved women's cholesterol and glucose metabolism and reduced [4]2020 Wolters Kluwer Health, Inc

Zinc

Many biological functions require zinc's contribution. Zinc is scarce in the human body, and mild to moderate deficiency may be frequent in certain groups, especially pregnant women. Recently, cosupplementation with zinc and vitamin E in women with GDM appears to improve insulin metabolism, lipid profile, and gene expression levels of Peroxisome proliferator-activated receptor gamma and low density lipoprotein receptor.⁵⁷ There is additional evidence that zinc and selenium supplementation reduces the incidence of gestational hypertension during pregnancy. A randomized, double-blind, placebo-controlled trial published in 2019 tested the effect of cosupplementation of magnesium, zinc, calcium, and vitamin D in women with GDM for 6 weeks and found that this intervention may reduce biomarkers of inflammation and oxidative stress (decreased serum high sensitivity C-reactive protein and plasma malondialdehyde concentrations, increased total antioxidant capacity levels), which also led⁵

5 conclusion

After considering all of the previously mentioned facts, we conclude that nutrition during pregnancy is extremely important for both the mother and the unborn child. You can not have risk agood pregnancy and delivery if nutrition isnot priorities. Adiversified, nutrient-rich, and well-balanced diet is necessary right from the pre-conceptional period. Properdiet,cNutraceuticals are very important for the growth anddevelopment of foetus during pregnancy and their deficiency are the major public health problem and are related with increased risk of adverse prenatal outcomes. Proper supply of energy and all nutraceuticals the time of pregnancy and lactation are necessary to gain required growth and development of the foetus. The necessity of an overall healthy maternal diet must be emphasized for providing anoptimal environment for foetal and infant growth and development, and for programming towards health. In order to attain a necessary improvement in supplementation behavior,

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