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Nutrition Requirements during Pregnancy, Childbirth and Lactation

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Short Communication

A great amount of research has taken place, over the last decade, that proved early nutrition and lifestyle choices affect subsequent health and disease pattern including developmental or metabolic programming. The International Early Nutrition research project, funded by the European Union, brought together researchers from different fields to develop consensus recommendations on diet and lifestyle choices for women before and during pregnancy, for infants, and for young children considering the long-term health effects. With a focus on the long-term effects on health, systematic reviews of published dietary standards, recommendations, and guidelines were conducted by Koletzko [1]. Additionally, systematic reviews of previously published reviews of dietary exposures or interventions in pregnancy, in newborns and early children up to the age of 3 years, that characterize impacts on ensuing overweight, obesity, and body composition, were also carried out. The consensus proposals were created by experts using the extensive knowledge of thirty three more participating groups. The study revealed that there is strong evidence for the relevant effects of early lifestyle, diet, and growth patterns on later health and disease risk. However, most current recommendations for pregnant women, especially obese women, and for young children need to take this fact into account.

With a focus on future health outcomes, it is important to give updated recommendations for optimal nutrition prior to, throughout, and after pregnancy as well as during lactation, infancy, and toddlerhood. These suggestions would help with the primary prevention of obesity and related non-communicable diseases. It was noted that the majority of women in western countries do not adhere to the dietary guidelines for a healthy diet and weight before and during pregnancy. What a healthy pregnancy diet should look like is a question that both women and medical professionals frequently ask. The key phrase should be "eat better but not more." This can be accomplished by replacing lower quality, highly processed meals with a variety of nutrient-dense, whole foods, such as fruits, vegetables, legumes, whole grains, and healthy fats with omega-3 fatty acids, which include nuts and seeds, and seafood. In comparison to the traditional western diet, which includes greater intakes of processed foods, fatty red meat, and sweetened foods and beverages, this diet composition provides nutritional richness and is less likely to be accompanied by an excessive energy consumption. Pregnant women who report "prudent" or "health-conscious" eating habits may experience fewer pregnancy difficulties and fewer unfavourable results for the health of their children [2].

Comprehensive nutritional supplementation that includes many micronutrients plus a well-balanced protein and energy has been linked to better pregnancy outcomes, with a concomitant decline in the incidence of low birth weight. The ketogenic diet, which excludes all carbohydrates, the Paleo diet, which forbids the consumption of dairy products, and any diet with an excessive amount of saturated fats should all be avoided. It is vitally necessary to develop solutions that allow for a quick assessment of dietary patterns, clear instructions on how to treat nutritional deficiencies, with support from qualified healthcare professionals.

Recent research has revealed that high gestational weight increase among women of normal weight predicts negative perinatal outcomes, while prepregnancy obesity predicts negative perinatal outcomes more strongly than gestational weight gain among women with obesity. Furthermore, poor perinatal outcomes are also linked to low body mass index and insufficient gestational weight increase. According to observational data, first-trimester growth is the best indicator of unfavourable outcomes, if any. To stop downstream difficulties for women and their children, interventions starting in the earliest stages of pregnancy or preconception are required. Human milk gives newborns specific nutrients and is linked to short- and long-term health advantages for both mothers and their babies. Lactating women can promote the best possible health for both themselves and their children by consuming a nutritious diet [3].

The development of diet plan with vitamin and nutraceutical profiles customized to a person's unique nutritional needs is gaining popularity. These individualized nutrition products are conceptually created depending on a person's genetics, epigenetics, metabolism, microbiota, phenotype, lifestyle, age, gender, and state of health. Developing specialized functional food and beverage products with the necessary blend of bioactive ingredients, such as lipids, proteins, carbohydrates, vitamins, minerals, nutraceutical, prebiotics, and probiotics, is a major hindrance. The use of nanotechnology to encapsulate one or more bioactive agents in a single colloidal delivery system may make it easier to produce products of this type. This delivery system might include one or more distinct types of colloidal particles that are intended to safeguard each nutrient in the meal while also delivering it to the body after ingestion in a bioavailable state. Overviews of the many bioactive that must be delivered were reviewed in a recent study, along with some of the difficulties involved in putting them into functional foods and beverages. It was emphasizes how colloidal delivery systems with nanotechnology capabilities can be created to combine various bioactive substances into a form appropriate for functional food applications, notably in the area of individualized nutrition [4].

Explanation

It is now known that adipose tissue, skeletal muscle, and the heart are organs that release various chemicals known as adipokines, myokines, and cardiokines under normal and pathological circumstances. These secretory proteins make up a closed network that is essential for the development of obesity-related illnesses, especially cardiovascular

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diseases. Particularly, the interaction of adipokines, myokines, and cardiokines is primarily responsible for the oxidative damage and inflammation that characterize obesity. Finding new therapeutic drugs or treatments that positively affect the expression of these molecules may have a significant positive impact on how obesity and associated cardiac problems are managed. Several nutritional therapies, including nutraceutical supplements, may serve as new therapeutic agents on the adipo-myo-cardiokines network, according to the findings of current studies. The main nutraceutical strategies to control the expression of lepton, adiponectin, apelin, irisin, natriuretic peptides, and follistatin-like 1 are described in one of the recent review studies, which focus on the biological action of the main adipokines, myokines, and cardiokines involved in obesity and cardiovascular diseases [5].

Pregnancy is not only a physiological process; it is also a situation marked by significant modifications in the metabolic and endocrine homeostasis of the mother, which are required for the fetoplacental development. Unfortunately, these systemic, cellular, and molecular alterations to maternal physiology also increase the risk of negative effects in the mother and fetus, including various changes brought on by viral infections.

Toxoplasmosis, rubella, cytomegalovirus, and herpes simplex viruses are common infections that are known to be congenitally and prenatally transmissible to neonates. Additionally, coronavirus infections like Middle Eastern respiratory syndrome (MERS) and severe acute respiratory syndrome (SARS) infections (especially the novel SARS-CoV-2 responsible for the COVID-19 pandemic), as well as enter virus, parvovirus B19, hepatitis virus, varicella-zoster virus, human immunodeficiency virus, Zika and Dengue virus, constitute pertinent targets for current research on maternal-fatal interactions in viral infections during pregnancy [6].

To promote healthy pregnancies generally and to prevent or at least lessen the effects of viral infections in particular, appropriate maternal education is essential from preconception to the early postnatal period. To lower the risk of virus-related gestational disorders and their concomitant difficulties in later life, it may be particularly important to lead an optimal lifestyle based on good nutrition plans and feeding interventions, whenever possible. One of the recent studies seek to give a summary of the recent research on the influence of nutrition in relation to potentially dangerous viral infections during pregnancy.

Compared to using conventional infant formula, breastfeeding is linked to a lower risk of developing obesity in the future. Less weight increase during the first two years of life is caused by breastfeeding, which indicates a decreased risk of obesity into adulthood. We investigated the idea that a high baby protein intake increases the risk of obesity and weight gain through elevated plasma amino acids, growth factors, and hormones like insulin and insulin-like growth factor 1 (IGF-1).

Conclusion

Formula-fed infants were randomly assigned in a large, multi-center, double-blind trial to either regular bottle milk with a high protein content or an intervention formula with a lower protein content that was more akin to levels found in human milk. In comparison to a breastfed reference group, protein-reduced formula normalized weight, body mass index, and body fatness up to 6 years and decreased the adjusted risk of obesity by 2.6-fold. The information at hand suggests plausible underlying mechanisms.

Therefore it can be concluded that baby nutrition has significant long-term programming effects on later BMI, obesity, and adiposity. Breastfeeding reduces the risk of developing fat and adiposity later in life. This serves as another justification for proactive and passionate breastfeeding promotion, protection, and support. Long-term risk for obesity and adiposity is increased by a high milk protein diet in infancy. Infant formula that contains high-quality protein in quantities more like to those seen in human milk should be given to infants who are not entirely breastfed. Infants should not give other sourced milk or other forms of very high infant protein intake.

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