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ASSIGNMENT; Under maternal health care, discuss the implications of Zinc deficiency on health of mother and child. Suggest practical measures to alleviate this deficiency.

Zinc is a trace mineral that plays a central role in cellular growth, specifically in the production of enzymes necessary for the synthesis of RNA and DNA. Zinc is prevalent in the brain, where it binds with proteins, thus contributing to both the structure and function of the brain. In humans, severe zinc deficiency can cause abnormal cerebellar function and impair behavioral and emotional responses. Age may be important to consider in the link between zinc deficiency and children’s cognitive development because children may be particularly vulnerable to zinc deficiency during periods of rapid growth and development, such as infancy and adolescence. Inner-city children from low-income families were found to have low concentrations of plasma zinc during infancy and adolescence, and dietary reports from middle-income families suggest moderate zinc deficiency during infancy. Severe maternal zinc deficiency has been associated with spontaneous abortion and congenital malformations (ie, anencephaly), whereas milder forms of zinc deficiency have been associated with low birth weight (LBW), intrauterine growth retardation, and preterm delivery (16). Importantly, milder forms of zinc deficiency have also been related to complications of labor and delivery, including prolonged or inefficient first-stage labor and protracted second-stage labor, premature rupture of membranes (PROM), and the need for assisted or operative delivery.

NUTRITIONAL INTERVENTION TO HELP ALLEVIATE ZINC DEFICIENCY

**Supplementation**

In developing countries, supplementation programs are expensive short term strategies that rely heavily on donor support and individual compliance. They are only appropriate for populations where the micronutrient status, such as the zinc status, must be improved over a relatively short time period. Supplementation is appropriate when the requirements cannot be met from habitual dietary sources (e.g. pregnant women, low birthweight infants, infants and children with acute or persistent diarrhea and those recovering from severe malnutrition). Furthermore, a health system capable of providing a consistent supply, distribution, delivery and consumption of the zinc supplement to the targeted group(s) is also required.

**Fortification**

Fortification with multiple micronutrients including zinc could be a cost-effective sustainable method for improving zinc status at a national level in countries where zinc deficiency is endemic. Alternatively, fortification can be targeted in specific regions and/or for certain high-risk groups (e.g. weaning foods for infants) within a country. Fortification does not require any changes in the existing food beliefs and practices of the consumer and, unlike supplementation, does not impose a burden on the health sector. Moreover, because the cost of fortification is borne by industry and the consumer, the costs to governments are generally low. Multiple micronutrient fortification is more cost effective than single fortification and, like supple- mentation, requires both an efficient production and distribution system within the country to be successful.

**Dietary modification/diversification**

Both supplementation and fortification rely on a stable infrastructure and require financial support on a long-standing sound economic basis. However, the third strategy, dietary modification/diversification, is a more sustainable, long term, economically feasible, equitable, and culturally acceptable strategy which can be used to alleviate several micronutrient deficiencies simultaneously without risk of antagonistic interactions. It involves changes in food selection patterns and/or traditional household methods for preparing and processing indigenous foods, with the overall goal of enhancing the availability, access, and utilization of foods with a high content and bioavailability of zinc throughout the year. To implement effective dietary strategies, knowledge of the local dietary patterns, food beliefs, preferences and taboos is required, as well as the ability to change attitudes and practices. In those developing countries where diets are predominantly cereal based and fermented cereals are not widely consumed, the major causative factor of zinc deficiency is not low zinc intakes, but poor zinc absorption. In contrast, for countries with diets based on starchy roots and tubers, low zinc intakes are a major determinant of zinc deficiency because these staples are poor sources of dietary zinc (Gibson, 1994). A variety of methods are therefore appropriate to combat zinc deficiency. The more important of these methods are outlined briefly below. Each aims to increase the total zinc intake and/or the absorption of dietary zinc.