Role of Zinc in Catch-up Growth of Low-Birth Weight Neonates

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بسم الله الرحمن الرحيم

"وَ مَا أُوْتِيتُمْ مِنَ العِلْمِ إِلَّا قَلِيلًا"

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To my great mother and my children Omar, Laila and Yasmine

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Introduction

Introduction

Low birth weight (LBW) is a challenging public health problem. Its high priority stems from the fact that it is a major predictor of infant mortality and that it contributes substantially to the overall burden of childhood handicap ***(Singh et al., 2013)***. The prevalence of LBW deliveries is higher in developing countries than developed countries and is associated with increased risks of poor health outcomes ***(UNICEF, 2009)***. The World Health Organization (WHO) defines LBW as the weight of live born infants less than 2,500 grams. The condition can be due to premature birth or intrauterine growth restriction or both ***(Stoll and Chapman, 2008)***. Low birth weight is an important predictor of infant death within 28 days of birth. It has been shown that LBW infants are much more likely to die than heavier babies ***(Yasmin et al., 2001)***.

Maternal low socioeconomic status, poor nutrition, and preterm birth are key mediating factors that need to be considered to improve birth weight of infants ***(Kader and Tripathi, 2013)***.

Providing extra support to LBW infants regarding nutrition and growth monitoring has great potential to reduce neonatal mortality rate and promote survival with good quality of life ***(Edmond et al., 2008)***.

Growth and nutritional deficits are almost universal in LBW babies. Many other sequel of LBW may be attributed to these

growth and nutritional deficits, making them a main target for early and effective interference ***(Kennedy et al., 1999)***.

Aggressive nutritional management of preterm infants has been proposed by the American Association of Pediatrics with the goals of achieving postnatal weight gain that approximates fetal growth rates, achieving fetal body composition, and minimizing later developmental delays ***(American Association of Pediatrics, 1998)***.

Micronutrient deficiency, including zinc, contributes greatly to impaired growth, health, and development of children in less-developed countries ***(Black, 1998)***.

Zinc is a trace element that represents an integral part of more than 100 enzyme systems in human body, and is essential for normal growth and development. Zinc supplementation reduces morbidity especially in low birth weight infants with reduced stores of hepatic zinc ***(Hess et al., 2009).***

The importance of zinc is reflected by the pathological effects that its deficiency state causes. Zinc deficiency is a serious nutritional problem among children of developing countries; with the consequences of retarded growth and development ***(Walker, 2009),*** and acrodermatitis enteropathica, a known potentially fatal condition of severe zinc deficiency ***(Jeejeebhoy, 2009)***.

Zinc can promote growth through changes in protein synthesis and cell replication, contributing to accumulation of lean tissue. This action is strongly assumed to be due to its

effect on insulin like growth factor-1(IGF-1) ***(Hoque et al., 2009)***.

Results of studies regarding the role of zinc supplementation in improving growth in LBW neonates are conflicting. In some studies, zinc supplementation enhanced more weight gain and reduced the incidence of low birth weight related problems ***(Hoque et al., 2009)***.

Other studies showed no added benefit of zinc supplementation to enhance growth or significantly reduce morbidity in LBW infants ***(Taneja et al., 2009)***.

As zinc status is difficult to identify due to its tight homeostatic mechanisms, zinc supplementation trials have become the best source of information about zinc nurture around the world and especially in risk groups such as children ***(Salgueiro et al., 2002)***.

Aim of the Work