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Importance of Vitamin A Related to Health Issues

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Short communication

Acute lower respiratory tract infections, in particular bronchiolitis and pneumonia which are the most severe forms of acute lower respiratory tract infections, are the leading cause of mortality in children under the age of five [1,2]. Pneumonia alone kills 1.8 million infants and young children every year [3]. Most of these likely preventable deaths occur in low-resource settings and are strongly linked to poverty, inadequate access to health care and under nutrition.

Several nutrition interventions have been shown to be effective in reducing the number of cases of acute lower respiratory tract infections and the potentially deadly outcomes associated with pneumonia. Vitamin A/ retinol is involved in the production, growth and differentiation of red cells, lymph cells and antibodies [4], and epithelial integrity. Because of its proven effectiveness in protecting against measles-associated pneumonia [5], vitamin A supplementation has been investigated as a possible intervention to speed recovery, reduce the severity and prevent against subsequent episodes of acute lower respiratory tract infections [6]. The results have not been at all consistent. Some authors have reported no benefits. While others only described positive effects for specific groups such as underweight children or those with pre-existing vitamin A deficiency. Vitamin A supplementation has also been found to increase the incidence of acute lower respiratory tract infections, mainly among children with better nutrient intakes.

Children with vitamin A deficiency seem to be at greater risk of illness and death due to respiratory tract infections. Pre-existing deficiency appears to worsen infection and vitamin A supplementation has been shown to reduce the risk of death in 6–59 month old children by about 23–30%. In the case of pneumonia that is associated with measles, large doses of vitamin A have a clear protective effect. Similar effects have not, however, been observed for acute lower respiratory tract infections using high and low doses of vitamin A. For example, lower doses have been associated with decreased risk of respiratory infection, and high doses have been shown to have a negative effect. There have been several theories put forward to try and explain the range of results and the possible biological mechanisms involved. For children with adequate vitamin A stores, supplementation with particularly high doses of vitamin A may cause a temporary malfunction in the regulation of immune function. This may result and perhaps lead to an increased susceptibility to infectious diseases.

Two recent systematic reviews on the role of vitamin A supplementation in the prevention of respiratory infections among children have concluded that supplements should only be given to children with poor nutritional status. The results also suggest that the dosage and potential adverse effects are important considerations when making recommendations. Over-dosage of vitamin A can cause toxicity that is associated with nausea, vomiting and loss of appetite that can further reduce nutrient intake. One study that evaluated the effects of a moderate dose of vitamin A found a positive effect among children with sufficient vitamin A intakes and no side effects of the supplementation were reported. Whether or not these positive effects would be associated with the increased intake of vitamin A containing foods has not yet been examined. In low-resource settings with high rates of acute lower respiratory tract infections, foods with significant vitamin A content such as animal products (liver, milk, cheese, and eggs) or fortified foods may not be frequently eaten. Better access to foods rich in provitamin A, such as mangos and papayas, may therefore be necessary under these circumstances through dietary diversification and homestead food production programmes.

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