Assessment of the Efficacy of Vitamin A Supplementation as an Adjuvant Therapy in Children with Pneumonia

Thesis

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بسم الله الرحمن الرحيم

"قَالُوا سُبْحَانَكَ لاَ عِلْمَ لَنَا إِلاَّ مَا
عَلَّمْتَنَا إِنَّكَ أَنتَ الْعَلِيمُ
الْحَكِيمُ"

صدق الله العظيم

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Mohamed Abd El Raouf

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List of Abbreviations

AIDS	Acquired immune deficiency syndrome
ALRIS	Acute lower respiratory infection
BVM	Broncho vascular marking
CAP	Community acquired pneumonia
CBC	Complete blood count
CIE	Counter immune electrophoresis
CMV	Cytomegalo virus
CRP	Capsular reactive protein
e/cy	Episodes per child-year
ESR	Erythrocyte sedimentation rate
DOT ELISA	Dot enzyme linked immune absorbent assay
GAPP	Global action plane for prevention and control of pneumonia
HB	Haemoglobin percentage
HSV	Herpes simplex virus
HIB	Hemophiles influenza type B
IRBP	Inter photo receptor retinol binding protein
LRAT	Lecithin: retinol acyl transferees
INF	Interferon
LA	Latex agglutination
L	Lymphocytes

MCH	Mean corpuscular hemoglobin
MCV	Mean corpuscular volume
N	Neutrophiles
NR	Natural killer cells
OTC	Over the counter
PCP	Pneumocystitis carinii pneumonia
PEM	Protein energy mal nutrion
RSV	Respiratory syncytial virus
RES	Retinoid esteras
RDA	Recommended daily intake
RBP	Retinol binding protein
RARS	Retinoic acid receptors
RXRS	Retinoid x receptors
RA	Retinoic acid
RDR	Relative dose response
SD	Standard deviation
TLC	Total leucocytic count
TH	T-helper
US	United states
VZV	Varicela zoster virus

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Introduction

Pneumonia is an infection of the lung. It can be caused by many different agents, including bacteria, viruses, fungi and parasites. Its the most common fatal infection acquired by children in the hospitals. In developing countries pneumonia is one of the two most common causes of death, diarrhea is the other ***(Stoffman and Phyllis, 1995).***

Incidence of clinical pneumonia in children under five years of age in developing countries is 0.29 episodes per child-year (e/cy). This equates to an annual incidence of 150.7 million new cases, 11-20 million of which are severe enough to require hospital admission ***(Rudan et al., 2004)***. It was reported that 12% of infants admitted for pneumonia in developing countries died before discharge ***(Djelantik et al., 2003).***

Vitamin A deficiency and acute lower respiratory tract infections **(ALRIs)** coexists as an important public health problems in many developing countries. About 190 million preschool children live in areas where they are at risk of vitamin A deficiency whereas 4 million children die each year because of ALRIS ***(Fawzi et al., 1998).***

Several reports have suggested benefits of vitamin A in measles, diarrhea, pneumonia, as well as reduction in childhood

mortality. Although a 2000 WHO review concluded that there is no benefit in pneumonia, the current WHO position is that "the official guidelines need to be revised using current evidence" ***(Mathew, 2010).***

Vitamin A is an essential micronutrient because it cannot be biogenerated denovo by animals. It must be obtained from plants in the form of provitamin A carotenoids alpha, beta, and gama carotens; and B-cryptoxanthin. These substances can be converted to vitamin A compounds in the body. In USA grains and vegetables supply approximately 55% of vitamin A intake. From food, dairy and meat products supply approximately 30%. Vitamin A as well as provitamin A are fat soluble and there absorption depends on the presence of adequate lipid and protein within the meal ***(Nelson, 2008).***

The effects of vitamin A and its metabolites on immunity include potentiation of the antibody response to T-cells-dependant antigens, increase lymphocyte proliferation and cytokine production, restore mucosal function and maintain mucosal integrity ***(Semba, 1994).***