

Thesis Title Functional Indices for assessment of vitamin A
 status in rural community

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ABSTRACT

Assessment of vitamin A status in the community by clinical or biochemical examination encounter limitations including a detection of late stages of vitamin A deficiency. Therefore, there is a demand for a simple and reliable test to detect early stage of the problem. The objectives of this study are to detect subclinical vitamin A deficiency in the population by conjunctival impression cytology (CIC) and rapid dark adaptometry which measures vision restoration time (VRT), to determine the association between functional (CIC, VRT) and biochemical parameters (serum retinol concentrations and hepatic reserves estimated by the relative dose response or RDR) and finally, to study the effect of a short term vitamin A supplementation on these functional indices.

Ninety-six school children in Pana District, Ubon Ratchathani Province, both males and females, aged 6-12 years were given a clinical examination including signs of xerophthalmia,

anthropometric (wt/ht) measurements for malnutrition, assessed for vitamin A status by CIC, VRT, serum determination and RDR test. No severe malnutrition or xerophthalmia were observed. Almost all children had adequate vitamin A store (RDR <20%) and 87% of these children had serum retinol concentrations above 1.05 $\mu\text{mol/L}$ (30 $\mu\text{g/dl}$). However, 28% of the children showed abnormal epithelium and 38% exhibited delay VRT (>180 sec). For this studied population, there was no relationship between the biochemical and functional indices. A possibility exist that changes in functional indices might occur before those of biochemical parameters. Thus, eighty-nine of the same population were divided into two groups to receive either placebo or 5000 IU/day of vitamin A in the form of retinyl palmitate every schoolday for 6 weeks in a double-blind nature. At 0, 4 and 6 wks children were examined for CIC and VRT. The results indicated that at 4 wk, vitamin A - supplemented group showed a trend of improvement in regard to restoration of normal conjunctival epithelium and reduction of VRT towards the normal range in comparison to the placebo group. At 6 weeks, changes of both functional indices were the same as of 4 wks. Children received placebo showed improvement regarding the reduction of delayed VRT children at 4 and 6 wks. This study suggested that CIC and rapid dark adaptometry appear to detect early physiological changes. However, more studies are needed concerning the use of CIC and VRT to effectively and reliably screen for population at risk of vitamin A deficiency.