

3836193 : MAJOR : FOOD AND NUTRITION FOR DEVELOPMENT ;
M.Sc. (FOOD AND NUTRITION FOR DEVELOPMENT)

KEY WORD : Vitamin A Interventions/ Lactating women/ β -carotene/ Total Body Stores/ Stable Isotope

VORACHART DHANANIVESKUL : IMPACT OF DIETARY VITAMIN A INTERVENTIONS ON TOTAL BODY STORES IN THAI LACTATING WOMEN.
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The contribution of a carotenoid rich foods to vitamin A (VA) status remains controversial. This study evaluated the efficacy of a provitamin A mid-day meal given 5 d/week for 3 months on changes in total body retinol stores (TBRS) by stable isotope dilution and in other VA status indicators among lactating women in Northeast Thailand. Seven hundred eighteen lactating women (1-12 month postpartum) were rapidly screened for low vitamin A intake and serum retinol below 0.87 $\mu\text{mol/L}$ (25 $\mu\text{g/dl}$). Eighty-five women were enrolled. They were matched by postpartum age, geographical area and randomized in a block fashion into 3 groups to receive one daily meal containing (A) dark green leafy and yellow/orange vegetables and fruits, (B) purified beta-carotene and (C) control (low carotenoid) vegetables and fruits. Fat content per menu was about 10 gm. The average beta-carotene content for the 12 weeks period in group A, B and C was 4.7, 3.6 and <0.05 mg/meal respectively. All subjects consumed over 95% of the food given. Prior to and following dietary intervention, vitamin A reserves were estimated by isotopic dilution method. In addition, maternal anthropometry, morbidity, and other indicators of VA status (MRDR at post-intervention only, serum and breast milk retinol and carotenoids, CIC and modified dark adaptometry) were examined. Twenty-four hour recall plus weighing method for one random day per week were collected throughout the study. 71 subjects completed the trial ($n = 24, 25$ and 22). Data of habitual diet revealed that group A consumed about half of the amount of preformed vitamin A than other groups. Serum and breast milk beta-carotene increased most in group B, followed by group A but breast milk retinol increased more in group A compared to others ($p=0.097$). Serum retinol increased in all groups (from ~ 21 to ~ 46 $\mu\text{g/dl}$), reflecting seasonality. TBRS was comparable at baseline among the three groups (77, 81, 95 mg, $p=0.87$). Mean (median) TBRS decreased by 15 (5), 3 (3) and 19 (14) mg in groups A, B and C ($p=0.4$). An inverse linear relation was detected between isotopic ratio at 3 day post-dosing and estimates of TBRS at both pre-intervention ($r = -0.82$, $p<0.0001$) and post-intervention ($r = -0.79$, $P<0.0001$). Thus, serum isotopic ratio of (D:H) 3 day post-dosing seems to be useful as an early indicator of TBRS. Serum and breast milk vitamin A can increase amidst decreasing TBRS in lactating women. Loss in TBRS may be prevented by daily beta-carotene supplements but less so with increased, short-term dietary beta-carotene intake. Longer interventions and more subjects are needed to show dietary effects on TBRS.