FOOD HABITS CAUSING THIAMINE DEFICIENCY IN HUMANS

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Thiamine deficiency may result from inadequate intake of thiamine or consumption of food containing anti-thiamine factors (ATF). Association with other pathologic conditions such as alcoholism or liver diseases has also been reported (1). In Thailand, thiamine deficiency is reported high in the northern and northeastern provinces (2). By determining the thiamine pyrophosphate effect (TPPE), in 21.6% of ill northern Thai subjects had the percent TPP stimulation which was greater than 20, and 25% in 198 northeastern Thais were found to be a thiamine deficiency by the same criteria. Approximately 80% of the northern Thais chew fermented tea leaves as stimulant while betel nut chewing is common in other parts of Thailand. Both betel nut and tea leaves have high thermostable antithiamine activities (ATA) (3, 4). Raw fermented fish containing thiaminase is eaten daily by the northeastern Thais (5).

The effect of tea consumption on thiamine status was conducted in the district of Fang, Chiangmai Province, Thailand (6). Twenty school children aged 15–17 years were given one liter of tea per day during the test period. The ATA of this tea was 2.1 µg thiamine destroyed per ml per hr with 7-day ingestion of this tea, TPP stimulation increased from 11.1±1.51 to 22.5±3.4% (P<0.01). This effect could be overcome by 10 mg per day of thiamine supplementation or a discontinuation of the tea. When fermented tea leaves chewing was abstained, a significant decrease in TPP stimulation from 20.6±3.3 to 14.9±2.6 was seen. Intake of 10 mg thiamine daily, decreased TPP stimulation to 7.2±1.4 (P<0.05) in the first experiment. Chewing of fermented tea leaves with or without the thiamine supplementation resulted in the TPP effect returning to the original values. If tea leaves were not chewed for 10 days as shown in the second experiment, the effect of thiamine supplementation could not be demonstrated.

A study of betel nut chewing and the consumption of raw fermented fish on thiamine status was conducted in the northeastern province of Ubol. Since most people in this area consume raw fermented fish in their daily diet, the subjects were asked to cook their fermented fish during the test periods. Withdrawal of betel nut plus cooking of fermented fish resulted in a significant decrease in TPPE from 16.4±1.5 to 6.6±1.1 (P<0.01). Resumption of betel nut chewing brought the TPPE up to 12.7±2.0% (P<0.01). Ten mg of thiamine per day decreased TPPE to 9.9±1.4% but this change was not statistically significant.

Cooking of fermented fish destroyed thiaminase activity and resulted in a significant decrease in TPPE (15.6±1.1 to 11.9±1.5, P<0.05). Further decrease was observed when 10 mg of thiamine was given daily (7.8±1.4, P<0.05). No change was observed when raw fish was taken with 10 mg thiamin per day. A dietary survey indicated that the daily thiamine intake of these subjects was adequate. Thai people consume a large amount of vegetables, both raw and cooked. Some vegetables grown locally and eaten in the rural area con-
tain ATF. The ATA of some local vegetables is high and thermostable. The effect of tea on the absorption and biological activity of thiamine is now under investigation.

REFERENCES


