

## Issue 57

### In a nutshell

Borderline thiamine deficiency is a real possibility in such high risk groups as alcohol abusers, the elderly and patients with high metabolic or catabolic states, such as burns and surgery.

A recent clinical trial has shown encouraging improvements in peripheral neuropathy after giving thiamine.

## Thiamine and the nervous system

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## NUTRITION RESEARCH REVIEW

### Study one: Thiamine in Alzheimer's disease

Investigators from the University of South Florida College of Medicine compared plasma and erythrocyte thiamine levels in a group of patients with Parkinson's Disease to those in a group with probable Alzheimer's disease.

The Alzheimer's patients had significantly lower plasma thiamine levels and a higher proportion of them had biochemical plasma thiamine deficiency, compared to the Parkinson's disease patients.

*Ref: Metab Brain Dis, 1998;13:43-53*

### Study two: Thiamine in diabetic neuropathy

Two hundred consecutive diabetic patients from Dar es Salaam with symptomatic peripheral neuropathy were assigned to receive either thiamine (25 mg/day together with pyridoxine 50 mg/day) or control supplementation (1 mg/day each of thiamine and pyridoxine).

Pain, numbness, paraesthesia and impairment of sensation in the legs were assessed, and blood thiamine levels were measured before and after 4 weeks of treatment.

After four weeks supplementation, the severity of signs of peripheral neuropathy decreased in 49% of the active patients, compared with 11% of the controls. There was a correlation between average pre-treatment whole blood thiamine levels and the severity of symptoms : (AOV  $p = 0.03$ ).

*Ref: East Afr Med J, 1997;74:803-8*

### Study three: Giving thiamine to head injury patients

A 2 year retrospective study looked at 218 head injury admissions to a Scottish neurosurgical unit, in which alcohol had been consumed shortly prior to head injury.

Only 21% of these patients had been given thiamine, and 56% of those patients who had been categorised as alcoholic.

This was despite the additional carbohydrate loads (I.V. dextrose or parenteral nutrition) given to 45% of patients. Of this sub-set of patients, only 29% had also been given thiamine, and in most cases both the dose and duration of thiamine given was inadequate.

*Ref: Alcohol and Alcoholism 1997;32:493-500*

#### Study four: Thiamine and mood

One hundred and twenty young adult females with normal thiamine status took either thiamine (50 mg/day for 2 months) or placebo, and had their mood, memory and reaction times measured.

An improvement in thiamine status was associated with reports of being more clear-headed, composed and energetic. The taking of thiamine had no influence on memory, but reaction times were faster following supplementation.

*Ref: Psychopharmacology 1997;129:66-71*

#### Study five: Thiamine, memory and cocaine use

Eight cocaine-dependent patients currently not using cocaine were given either 5 g/day of thiamine on two days a week apart, or placebo, in a double-blind protocol. Approximately 3 hours after taking the supplement, subjects had a memory scanning task, during which EEG monitoring was done to assess event-related potentials (P300).

The thiamine-supplemented group had significantly improved recognition accuracy and P300 amplitude.

*Ref: Psychiatry Res, 1997;70:165-74*

#### Comments

There has been much debate about the adequacy of the thiamine status of the general population, even in the developed world. Some nutritionists believe that sub-clinical thiamine deficiency is quite common, particularly in countries where thiamine enrichment of cereal foods is not practised.

What is clear from a number of reports is that in high-risk populations the likelihood of borderline thiamine deficiency is quite high. These groups include alcohol abusers, the elderly and patients with high metabolic or catabolic states, such as burns and surgery.

The five studies summarised here and published over the last 18 months do not all have strong study design. However, collectively the results should ring alarm bells in doctor's minds when they assess patients in such high risk groups.

For example, a number of studies have demonstrated that clinicians do not adequately assess or treat thiamine status, even in patients in whom you would think it most obvious - such as those with dementia or acute psychosis.

In the case of study three, patients with head injury and a history of recent alcohol intake often missed out on thiamine supplementation. This is a simple measure that the study authors believe could prevent

additional insult to a damaged brain. By having extra IV carbohydrate, many of these head injury patients had even higher thiamine requirements than normal.

The link between borderline thiamine status and mental functioning is of great interest. In an earlier issue of these Updates, we reported a study which found benefits from thiamine supplementation in apparently healthy elderly adults.

Unfortunately the study design in some of the studies reported here does not allow definite conclusions about the link between thiamine and mental function.

For example, thiamine is closely associated with other co-factors (such as magnesium) in energy metabolism, and so it is hard to interpret observational studies when those other co-factor nutrients are not taken into account.

The controlled trial in Dar es Salaam is particularly interesting. The improvements in peripheral neuropathy that they reported after giving thiamine supplements were certainly enough to make clinicians take notice.

As so often in these Updates, the safest conclusion to draw is that this is an issue of importance, important enough to warrant larger scale, randomised control trials.

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