LEVELS OF COPPER AND ZINC IN DEPRESSION

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Abstract: The study was undertaken to estimate plasma copper and zinc in thirtyfive depressed patients. Two blood samples were drawn from each patient, one before starting treatment and the second after recovery from depression. The results were compared with the thirtyfive normal healthy individuals. The mean plasma copper in controls, depressed patients and in patients after recovery were 106.82, 122.14 and 104.22 μg/dl, respectively. The copper levels in patients when depressed were significantly higher as compared to controls and after recovery from depression. The mean plasma zinc levels in controls, depressed patients and after recovery were 115.80, 107.62 and 125.68 μg/dl, respectively. No significant difference could be obtained between control and depressed patients. However, the values were significantly higher in recovered patients compared to patients with depression.

Key words: Copper Zinc depression recovery

INTRODUCTION

During the last decade there has been a rapid increase in the number of trace elements shown to be essential and of potential significance in human and nutrition. The possibility that an excess or a deficiency of trace element can produce psychiatric symptoms has been considered in several studies. Schizophrenics have been associated with zinc and manganese deficiency and the patients improved when the levels of these elements were corrected (15). There is a considerable evidence that vanadium may play role in depressive psychosis (14). Psychiatric disturbances have been reported in patients with disorders of other trace elements like copper and zinc (7). Elevation of serum copper and ceruloplasmin levels in schizophrenia have been reported (15). Increased levels of serum copper has been commonly seen in gastrointestinal tract cancer (13).

One of the most common conditions associated with zinc deficiency is acrodermatitis enteropathica. This is characterised by skin lesions and gastrointestinal symptom. Psychiatric complications are known to occur in this condition (12). Other medical conditions associated with zinc deficiency are acute psychiatric complications like depression (9) and thought disorders occurring in normal orientation (8). Low zinc levels have been shown to be acting as cofactor in the pathogenesis of dementia (3, 17). Zinc deficiency is associated with relative copper excess. Various studies have indicated low zinc and high copper levels in schizophrenia. Low zinc have been found in brain autopsy specimens from schizophrenics (10). A psychiatric syndrome characterised by thought disorder was followed by acute zinc deficiency (8). The present study reports a plasma copper and zinc levels in patients with depression.

METHODS

Thirtyfive patients attending the Psychiatry outpatient department of Dayanand Medical College & Hospital were selected using Feigher’s criteria for
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RESULTS AND DISCUSSION

The levels of plasma copper and zinc are represented in Table I. The plasma copper in depressed group was significantly higher as compared to control (P < 0.01). After recovery, copper levels were significantly lower compared to levels during depression (P < 0.005). The plasma zinc levels in depressed patients showed no significant difference when compared to controls (P > 0.05). However, patients after recovery showed significant increase in plasma zinc levels (P < 0.01).

Elevation of serum copper in schizophrenia has been reported by various workers (15, 16). Barrass et al (2) have summarised the effects of tranquilizers and antidepressants on the ceruloplasmin catalysed oxidation of the biogenic amines, noradrenaline and 5-hydroxytryptamine. They suggested that ceruloplasmin, which accounts for 95% of copper in normal individuals, may effect the relative concentration of noradrenaline and 5-hydroxytryptamine in those areas of brain where these compounds act as neurotransmitter. Ceruloplasmin, by its effects on the life time of biogenic amines could function in the regulation of brain chemistry (11). Interference with this enzyme may lead to a chemical imbalance reflected in the appearance of abnormal mental status. High copper levels could also block the function of dopamine beta-hydroxylase which is highly concentrated in locus ceruleus resulting in impaired noradrenaline synthesis.

Zinc levels showed significant rise after recovery when compared to levels in the patients during depression. Zinc supplementation reverses excessive emotionality (15). Acute zinc deficiency can cause depression which improves by zinc supplementation (9). Antipsychotic drug perphenazine increases hippocampal zinc (4). It is presumed that antidepressant drugs may increase the brain zinc levels which have beneficial effect on patients of depression.

REFERENCES


