

Insufficient Ascorbic Acid Uptake from the Diet and the Tendency for Suicide

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Abstract

The dietary habits of 12 women who attempted or committed suicide were studied. The result shows their ascorbic acid intake was significantly lower compared with the subjects in the control group. A conceivable explanation is that these women had somehow raised tissue levels of vanadium, and their ascorbic acid intake was not adequate enough to deal with depression due to excessive vanadium, resulting in attempted or committed suicide.

Key Words: vanadium, ascorbic acid, suicide, depression.

Introduction

As a part of a large project dealing with the effect of diet on the psychiatric condition, the dietary habits of those who attempted or committed suicide were studied. This paper reports the possible significance of ascorbic acid in understanding suicide.

Method

For this study, the data on the subjects in the "women in Gothenburg" project (Bengtsson et al, 1973) were reanalyzed. The women were a representative sample of the female population in the city of Gothenburg, Sweden, who were 38,46,50,54, or 60 years old in January, 1968. They underwent a variety of examinations and 286 women participated in both psychiatric and dietary studies. Their psychiatric state in 1968 or 1969 was studied by the Hamilton Rating Scale (HRS) (Hamilton 1967) and other psychiatric data were later reclassified in terms of the DSM-III criteria (American Psychiatric Association 1980). This was a point prevalence study of past two weeks, and it took one year to complete (Hallstrom 1984). In addition, they were also asked if they had ever thought about or attempted suicide. Their responses were checked against case

records from all the psychiatric hospitals and inpatient clinics in Gothenburg and from psychiatric out-patient centers in the city. Inaccurate replies were corrected in this way (Hallstrom 1977). After this study, three women committed suicide. In addition, there were six women who made serious attempts and three women with less serious attempts for suicide. In all, then, there were 12 women who attempted or committed suicide. Their age distribution was as follows: 46 years old (N = 3), 50 years old (N = 5), and 54 years old (N = 4).

For the control group, 12 women without depression in terms of both the HRS and DSM-III criteria as well as no history of suicidal attempts were selected by means of stratified systematic sampling in order to match the age and frequency distribution of the suicidal group.

The information on the dietary habits of the 24 women in the sample was obtained by reanalyzing the detailed interview by dietitians as well as a questionnaire from 1968 or 1969. In the original design of the "women in Gothenburg" project, the information on dietary habits thus obtained was at the same time checked against the mean 24-hour urinary nitrogen excretion. The protein intake estimated from urinary nitrogen was reported to deviate insignificantly in terms of statistics from the interview and questionnaire data (Lenner et al., 1977), suggesting the reliability of the dietary data. The possibility of medication, including vitamin tablets, was also controlled.

The suicidal and control groups were compared in terms of the mean daily intake of calcium, phosphorus, iron, vitamins A, D, and E, thiamine, riboflavin, niacin, and ascorbic acid. In addition, they were also compared in terms of the dietary tryptophan ratio and dietary tyrosine ratio, the rationale being that less uptake of tryptophan or tyrosine, as compared with the other large neutral amino acids in the serum for access to the uptake carrier would result in less serotonin (5-HT) or

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norepinephrine in brain neurons (Fernstrom 1981) and further to depression (Shopsin and Feiner 1984; Schildkraut 1965) and possibly to suicide (Avery and Winokur 1978; Asberg, Traskman, and Thoren 1976). Carbohydrate intake was additionally checked because carbohydrate meals raise both brain tryptophan and tyrosine levels (Fernstrom 1981).

Results

The results showed no difference between the suicidal and control groups in these dietary factors examined except for ascorbic acid. The suicidal group had much less uptake of ascorbic acid ($X = 76.16\text{mg}$, $s.d. = 29.08$, $N = 12$) than the control group ($X = 111.00\text{mg}$, $s.d. = 37.96$, $N = 12$), and the difference was significant at the two-tailed 5% level by the Mann-Whitney U test ($U = 34$).

Discussion

The result of this study indicates the possible involvement of vanadium (Naylor 1984). It has been suggested that raised tissue levels of vanadium are related to both depression and mania (Naylor and Smith 1981), and depressive illness often leads to suicide (Avery and Winokur 1978). However, large doses of ascorbic acid are effective in treating both manic and depressive patients (Naylor and Smith 1981). Therefore, a conceivable explanation for the finding of this study is that these women in the sample possibly had raised tissue levels of vanadium, and those with insufficient uptake of ascorbic acid from the diet to deal with vanadium became clinically depressed and attempted or committed suicide. Unfortunately, no information on the tissue levels of vanadium for these subjects in 1968 or 1969 is available, and this is a mere speculation. Nevertheless, this finding suggests an avenue for future research on suicidal behaviour from the Orthomolecular perspective.

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