Supplementary Vitamin C in the Treatment of Parkinson's Disease.

Dr.Fizel Al-Himyari

Department of Medicine-Division of Neurology .
Babylon University –College of Medicine / Iraq

Abstract

Background: Parkinson's Disease(PD) is a slowly progressive, age related neurodegenerative disease characterized clinically by bradykinesia, rigidity, tremor, postural instability and gait dysfunction. The aim of the study is to evaluate the efficacy, of Vitamin C as an adjunctive therapy to Levodopa in Patients with Parkinson's disease (PD).

Patients and Methods: The study was conducted at Mirjan Teaching Hospital, Babylon, Iraq from 1-June-2006 to 1-Dec.-2007. Twenty patients (10 males and 10 females) with insufficient response to Levodopa (motor fluctuations and dyskinesia) and 20 control patients comprised the study groups. The Patients were given an oral vitamin C (200 mg), administered once daily for a period of six months. Vitamin C was taken with Sinmet (l-dopa: Carbidopa) tablet which is of 25/250 concentrations, associated with further followup for 12 months. The UPDRS (Unified Parkinson's Disease Rating Scale) Part 11 and 111 were used for assessment.

Results:There was a short term (one week) and long term (6 months) clinical benefit to the Vitamin C therapy, [P-value<0.05]). . The dyskinesia was not increased in the PD patients. Gastric upset was seen in 25% of the PD patients and in 10% of the control group.

Conclusion: Vitamin C in a dose of 200 mg once daily is effective as an adjunctive treatment in patients with PD. We recommend that Vitamin C is added to Levodopa in a dose of 100-200 daily. Further studies are needed to determine whether Vitamin C is effective and tolerated if administered for periods longer than 6 months.

Key Words: Parkinson's disease, Vitamin C.

Introduction

Parkinson's disease (PD) is a slowly progressive, age-related neurodegenerative disorder that is characterized clinically by bradykinesia, rigidity, tremor, postural instability and gait dysfunction (1,2). PD is the only chronic neurodegenerative disease for which there are highly effective symptomatic therapies available. Treatments are primarily based on a dopamine replacement strategy using Levodopa or dopamine agonists, and provide marked improvement in motor symptoms and disability. The improvements enable many patients to pursue a full range of professional or other daily activities and to maintain a largely uncompromised quality of life, particularly in the early stages of the disease. Unfortunately, the therapies do not appear to change the slow and steady progression of the underlying neurodegenerative process and clinical disability. On the contrary, sustained Levodopa treatment, which is still the mainstay of antiparkinsonian drug therapy, causes potentially disabling drug-induced involuntary movements and wearing-off effects in 30-50% of patients after 2-5 years of treatment (3).

Vitamins are organic compounds that are essential in small amounts for normal metabolism. Daily vitamin requirements have been established by the National American Academy of Sciences and

National American Health Council. The recommended daily value for vitamin C ,as an antioxidant substance, is 75-90 mg (4).

The aim of the present study was to investigate if supplementary Vitamin C added to Levodopa was effective in patients with PD.

Patients and Methods

The investigation was a single center study. It was conducted in Mirjan Teaching Hospital Babylon, Iraq, from 1-June 2006 to 1-Dec. 2007. Follow-up was obtained 12 months after cessation of vitamin C administration. Twenty patients with PD for longer than 6 years) of both sexes (10 males and 10 females) between ages 20-80 years were enrolled in the study. The patients had insufficient response to Levodopa therapy (motor fluctuations and dyskinesia). Each PD patient was given Vitamin C(200 mg) orally once daily for a period of 6 months. Vitamin C and Levodopa (Sinmet25/250) were taken together The control patients were those presented with PD for a period longer than 6 years with an age between 30 -75 years old.

The Clinical assessment including the UPDRS Part 11 (Daily living activities) and Part 111(Motor skills) (5) were conducted at "on" state at the end of the first week and at 6 months.

There was spontaneous reporting of adverse events recorded by the patient and by performing also hematological and biochemical tests as well as vital signs, ECG and ultrasound screening. All these tests were done at baseline and every 4 weeks.

The statistical analysis used Chi square and hypothesis to test for a difference between PD and control groups (6). The result was considered significant if P-value<0.05 and highly significant if P-value<0.01.

Results

There was a short term (one week) and long term (6 months) clinical benefit in the PD patients evidenced by an increase in the "on" time duration without increasing in the rate of dyskinesia.

The number of PD responders at the end of the first week was (3 patients out of 20) and at 6 months (6 patients out of 20)so the total was 9 patients out of 20) (P-value <0.05 which is considered significant) (Figure-1).

There was no increase in the dyskinesia in any of the patients. The on duration increased in only five of the control group and the dyskinesias increased in 10% .Gastric upset was seen in 25% of the PD patients and in 10% of the control patients.

Both the abdominal ultrasound and urine examinations did not reveal any renal stone formations which could be related to Vitamin C .

Characteristics of the study groups

	No: of male	No: of female	Age (years)	Clinical benefits		p- value
				One week	Six months	
Patients	10	10	(20-80)	3	6	p<0.05
control	10	10	(30-75)	2	3	p>0.05

Discussion

In this study, adjunctive Vitamin C (200 mg once daily) was effective and tolerated. The therapy improved PD symptoms.

Neuroprotective therapies have been defined as interventions that produce enduring benefits by influencing underlying pathogenesis and thereby preventing or delaying the onset of the disease or its progression(8). Fahn from Columbia University, New York, found that PD patients given large doses of oral Vitamin C and E 1300 mg and 3200 I.U. daily respectively had delay of the progression of their disease to the extent that they needed L-dopa 2-5 years later than a group of PD patients who were not taking supplements(9,10). Also, a study by Reilly and colleagues revealed that Vitamin C increased the levels of L-dopa by prolonging the benefits of action(11).

In a study of eight patients with early Parkinson's disease by Yapa, seven showed evidence of Vitamin C deficiency. Of the seven, four suffered from early Parkinson's disease. Of the 93 without evidence of Vitamin C deficiency only four had Parkinson's disease. This indicates a significantly higher prevalence of Parkinson's disease in the group with Vitamin C deficiency(12).

In our study of PD patients, Vitamin C seems to increase the absorption of L-dopa in addition to having antioxidant effect. We reached this conclusion because there was a short term (one week) and long term (6 months) clinical benefit. The study showed a increase in the on-time duration without increase in the dyskinesias.

In a preliminary study (13), L-dopa and Vitamin C administered to PD patients produced several improvements.

We recommend that Vitamin C (100-200mg daily) be administered to PD patients, for 3-6 months. Further studies are also needed to investigate whether Vitamin C is effective and tolerated if administered for periods longer than 6 months.

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