

The circadian rhythm of blood levodopa levels in patients with Parkinson's disease with wearing-off

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Received 27 February 2012; received in received from 5 March 2012; accepted 9 March 2012

Abstract

In patients with advanced treatment-resistant Parkinson's disease, the effect of diet and the relationship with levodopa levels were examined. The subjects included nine patients with Parkinson's disease, who had been treated with levodopa for a long period and who exhibited "wearing off" and "on-off" phenomena. There were four men and five women; mean age, 66.1 years old (63-72); mean H&Y stage, 3.7 (3-4.5); mean disease contraction period, 10.2 years (7-23); mean levodopa daily doses, 388.9 mg (300-700 mg). In five of the nine patients, blood levodopa density was low level and the OFF state developed after a meal. In three of these five people, the effect of the diet was thought about only to one of three meals. In the remaining two people, the effect of the diet was thought about than two of three meals.

Keywords: Parkinson's disease, wearing off, diet, on-off, redistribution diet

Introduction

Parkinson's disease is an extrapyramidal disease, which is characterized by an intracerebral lack of dopamine and a relative increase of acetylcholine. Therapy for Parkinson's disease includes medical therapy, diet modification, motor, lifestyle changes, rehabilitation, and surgery. The focus is medical therapy. However, the advanced PD patients show the wearing-off phenomenon in which the duration of the effects of medicine is reduced. Moreover, the on-off phenomenon in which symptoms worsen suddenly regardless of when medicine is taken is known. Nutrition therapy includes protein redistribution food [1]. Levodopa competes

with dietary neutral amino acid, and it is absorbed by the bowels. When the level of the protein in blood is lowered by levodopa medication, the absorption of the drug may improve. Protein redistribution food usually reduces the quantity of the protein of breakfast and lunch, and increases the quantity of protein of supper. Daytime movement thereby becomes easier. However, there are many patients who do not last long because protein redistribution food is very different from the normal diet. Besides, a reported side effect is dyskinesia. The introduction requires careful examination [2]. The pharmacokinetics of levodopa formulation differ in individuals, and it is difficult to set criteria uniformly. We judged whether protein redistribution food might

anticipate an improvement in symptoms with nine patients with progressive Parkinson's disease.

Subjects and methods

In patients with advanced treatment-resistant Parkinson's disease, the effect of the diet and the relationship with levodopa levels were examined. The subjects included nine patients with Parkinson's disease, who were treated with levodopa in the long term and exhibited "wearing-off" and "on-off" phenomena. There were four men and five women; mean age, 66.1 years old (63-72); mean H&Y stage, 3.7 (3-4.5); mean disease contraction period, 10.2 years (7-23); mean levodopa daily doses, 388.9 mg (300-700 mg). Blood levodopa levels were measured two hours after breakfast, lunch, and supper, and the relationship with the motor function at the time was examined. Blood levodopa levels the at least drug concentration that surely became effective or more were defined as High. Levels lower than this were defined as Low. The motor function became a mark with four phases from 0 to 3. The daytime lowest motor function was assumed OFF, and a further motor function was defined as ON.

Results

A list is shown in Table 1. The results that were similar to 2nd when Patient c measured were found. Similar results were seen in two days when Patient c was measured. In Patients b, f and i, blood levodopa level was low, and symptoms indicated the off state in one of three meals. It is difficult to introduce protein redistribution food in more than two meals per day. It is actually only one meal of 1st in which we can intervene using diet. Patients b, f, and i fall under this.

Discussion

Protein redistribution food is known to be effective as a diet cure for patients with Parkinson's disease. However, this diet is usually accompanied with quite a few difficulties unlike the pattern that a Japanese

takes in to continue this constantly. It is less clear how effective the measures are. We examined the extent of the bad influence of diet in patients with advanced Parkinson's disease. In the protein redistribution food, the quantity of protein of breakfast and lunch was reduced, and that of supper was increased. The neutral amino acid derived from the diet competes with the levodopa absorption from the bowels. As a result, blood levodopa levels decrease, and the motor function of the patient decreases. Therefore it is rational to reduce the protein of the diet during the day when the physical activity is greater [3]. However, it is unknown how effective protein redistribution foods are because bowel absorption varies among individuals. Furthermore, it is also unknown how much protein redistribution food should be introduced into the diet. In this study, five possible patients whom protein derived from a diet influenced were present in nine Parkinson patients that control was difficult. In three of five people, the effect of the diet was thought about only to one meal. In the remaining two people, the effect of the diet was thought about than two meals. Patient c showed similar results for two days when observed. It is nutritionally undesirable to adopt a protein redistribution diet for more than two meals per day [4]. In other words, a protein redistribution diet should be used with patients in whom only one of three meals influenced. In conclusion, the protein redistribution diet was worth trying with three of the nine patients in this study with advanced Parkinson's disease.

References

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Table 1. Summary of results

Patients		a	b	c1	c2	d	e	f	g	h	i
ON state	Levodopa concentration High	●●			●	●	●●	●	●●	●●●	
	Levodopa concentration Low	●	●●				●	●	●		●●
OFF state	Levodopa concentration High										
	Levodopa concentration Low		●	●●●	●●	●●		●			●
		1/3	3/3	3/3	2/3	2/3	1/3	2/3	1/3	0/3	3/3