

Gargle effect of aqueous citric acid on dietary intake of patients with progressive muscular dystrophy

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Abstract

Muscular dystrophy patients with attached respirators at Tokushima Hospital have little dietary intake, and there are many patients who experience weight loss. A possible cause is considered to be development of taste disturbance and a decrease in the amount of salivary secretion in these patients. In this study, we added aqueous citric acid to the oral cavity of the patients and examined whether salivary secretion and appetite / dietary intake increased. The subjects were five hospitalized muscular dystrophy patients using respirators in A ward. The patients gargled 1% citric acid water before eating, and the weight, quantity of salivary secretion, and the dietary intake before and after this measure was taken were measured. All the subjects increased the degree of wetness of the saliva by gargling the citric acid water, but no increase of dietary intake / weight was seen. However, intra-oral refreshment was obtained, and a diet was made delicious.

Key Words: Gargle effect, Aqueous citric acid, Salivary secretion, Progressive muscular dystrophy, Muscular dystrophy

Introduction

Tokushima Hospital A ward is mainly reserved for muscular dystrophy patients. For 60% of the inpatients, dietary intake did not reach standard 70%. Therefore, the weight of many patients decreased. Dysgeusia was found in all the patients when examination of taste sensation was performed on eight inpatients who used a respirator all day. Most of the patients with dysgeusia took antihypertensive medications and a diuretic. Dysgeusia may be caused by these medicines.

On the other hand, a fall in the quantity of salivary secretion is regarded as one of the causes of dysgeusia [1,2]. The quantity of salivary secretion decreases, or the oral cavity tends to become dry. The nasal mask and

mouthpiece used in artificial respiration may be the cause. We thought that dietary intake might increase when we promoted the quantity of salivary secretion in some way. Kakigi reported as follows [3]: moisture retention / the warming of the oral cavity is obtained at the same time as salivary secretion is promoted by some methods. These methods include chewing gum, eating acidic foods, and placing ice in the mouth. In this study, we added aqueous citric acid into the oral cavity of the patients and examined whether salivary secretion and appetite / dietary intake increased..

Subjects and methods

The subjects were five patients with Duchenne muscular dystrophy. All the subjects had been

admitted to the A ward, and had a respirator attached all day. They all gave written agreement to this study. With the help of a nurse, the patients gargled 3-5 times for approximately five minutes using 150 ml of aqueous citric acid before eating. The diet intake ratio and the weight of the patients were recorded during the period one month before starting the gargling to two months after the start. The degree of wetness of the saliva on the upper tongue of the patients was measured before and five minutes after gargling in morning.

Results

In Patient 1, the degree of wetness of the saliva before the gargle was 2mm early in the morning, 3mm before lunch and 1mm before supper. The degree of wetness of the saliva one month after the gargling began rose to 2mm, 7mm, and 10mm, respectively. The degree of wetness of the saliva two months after the gargling began rose to 3mm, 8mm, and 12mm, respectively. In Patient 2, the degree of wetness of the saliva before the gargle was 3mm early in the morning, 9mm before lunch and 3mm before supper. The degree of wetness of the saliva one month after the gargling began rose to 6mm, 11mm, and 12mm, respectively. The degree of wetness of the saliva two months after the gargling began rose to 3mm, 18mm, and 18mm, respectively. In Patient 3, the degree of wetness of the saliva before the gargle was 1mm early in the morning, 2mm before lunch and 2mm before supper. The degree of wetness of the saliva one month after the gargling began rose to 2mm, 5mm, and 4mm, respectively. The degree of wetness of the saliva two months after the gargling began rose to 3mm, 6mm, and 6mm, respectively. In Patient 4, the degree of wetness of the saliva before the gargle was 1mm early in the morning, 4mm before lunch and 9mm before supper. The degree of wetness of the saliva one month after the gargling began rose to 4mm, 7mm, and 7mm, respectively. The degree of wetness of the saliva two months after the gargling began rose to 2mm, 8mm, and 11mm, respectively. In Patient 5, the degree of wetness of the saliva before the gargle was 1mm early in the morning, 2mm before lunch and 1mm before supper. The degree of wetness of the saliva one month after the gargling began rose to 2mm, 5mm, 4mm, respectively. The degree of wetness of the saliva two months after the gargling began rose to 4mm, 5mm, and 5mm, respectively. As for

Patient 5, the luxury goods often almost took in a gross quantity despite the gargle with the citric acid water.

The average of the dietary intake and body weights of the present patients before and after gargle treatments are shown in Figure 1.

Unfortunately, prominent changes were not observed. On the other hand, four patients felt there was an increase of the quantity of salivary secretion due to the gargle measures. However, one patient said that salivary secretion did not change. A common opinion was that the gargle measures provided refreshment. Also, all the subjects felt that the measures improved the taste of the food.

Discussion

In this study, the degree of wetness of the saliva increased by gargling the citric acid water, but the dietary intake did not increase. Also, no change was seen in body weight measurement results. The correlation with the weight of the quantity of salivary secretion was not clear. There may be the following problems. The conditions of diet form and snack were not constant. The number of patients was small. Also, the internal use of medicine causing the dysgeusia may be a reason that there were few effects from the gargle measures. For Patient 2, the dietary intake slightly decreased following gargling, but there is a possibility that this was connected to an increase in weight from having food with extra nourishment for breakfast. In this patient, the increase in the dietary intake did not lead to an increase in weight. The promotion of pre-prandial salivary secretion may have led to gustatory improvement and increase in appetite / dietary intake the sapid substance dissolved in saliva, and to arrive at the taste bud. However, the five muscular dystrophy patients who were studied this time did not show this effect. On the other hand, the oral cavity was refreshed, and they found the food tastier when they gargled before eating. Based on these results, we want to find support methods for increasing dietary intake in future by adjusting the environment for the diet of the patients.

References

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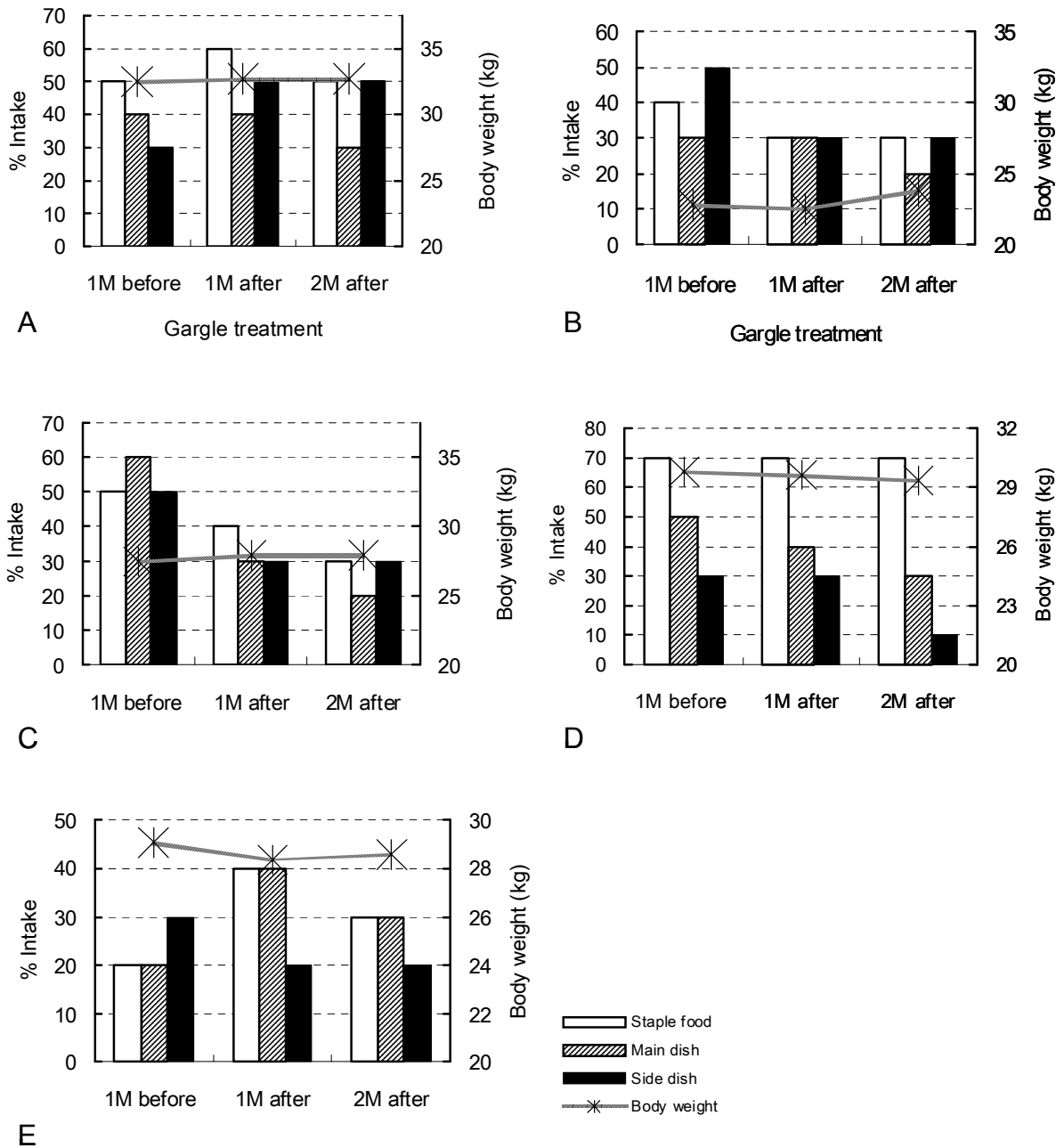


Figure 1. The average of the dietary intake and body weights of Patient 1 (A), 2(B), 3(C), 4(D), 5(E).