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Analysis of EEG during the swallowing in young and elderly people

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Introduction

Dysphagia and swallowing disorder are obstruction of returning to home in elderly people and disorder of central nerves system patients. And we could not approach for intensive rehabilitation with low diets. But we understand that early approach for Dysphagia and swallowing disorder people are very effective by nutrition support team in Japan. A nutrition support team is consists of medical doctor, registered nurse, dietetic manager, occupational therapist, speech therapist and others. We measured bioelectrical data (EMG, swallowing sound, respiratory rhythm, and elevation of the hyoid bone) at around the cervical part in elderly peoples. Our data indicated that muscle activities were delayed and elongation with dysphagia peoples. The aim of this study is to clarify for satisfied swallowing with dysphagia peoples. This time, we measured electroencephalogram (EEG) and other bioelectrical data during the swallow in normal subjects.

Material and Methods

Ten normal volunteers (5 women and 4 men), between the age of 21 and 22, participated in this study. The subjects reported no history of dysphagia and no medical problems or medication that might affect swallowing. The protocol was approved by the Kanazawa University Medical Ethics Committee, and all subjects signed consent forms.

Eight EEG skin electrodes were utilized for each subject by the 10-20 international methods. EEG Material was Intercross-310 (Intercross Inc.) and analysis by original software. Our analysis methods were spectrum analysis and basic statistic.

Three food categories were used: liquid, pudding, rice. A number of bites and timing of swallow were individuals.

Results

The amplitude of EEG was significant decrease ($p < 0.05$) after swallow rice and pudding compared to before swallowing. In spectral analysis, after swallowing Alfa wave and Theta wave were increase compared to before swallowing. Beta wave and Gamma wave were decrease compared to before swallowing.

Conclusion

We could find that mellow out by an influx of food to the stomach by feeding activity. This study indicates that method of brain wave analysis was important for dysphagia peoples.