Secular Change of Effect of Motivative Exercise by FNIRS Test

Yoshiko Morita\textsuperscript{1}, TAKIZAWA, Shigeo\textsuperscript{2}
\textsuperscript{1}Okayama Rehabilitation Hospital  (E-mail : y-morita@okayama-reha-hp.or.jp)
\textsuperscript{2}Biophilia Institute

Purpose
Motivative exercise is easy, and can be carried out always and anywhere.
The functional improvement of the user by this introduction is already reported.
In this research, we aimed at investigating what kind of change happens to a patient through the continuation for one year after the fist introduction.

Subject and Method
The examinations were done for 12 outpatients of this hospital. All the members were doing research participation from last year. Two persons had ended hospital visit. This research is continuation from the research of the previous year, and has passed through examination of the ethical committee of this hospital. Cerebral function evaluations were done with the fNIRS examination by change of the oxyhemoglobin between the rest and task using Shimazu NIRS device and the analysis software following last year.

We performed activation comparison of the cerebral function of the motivative exercise of Knee joint flexural extension and ankle joints plantar flexion and the dorsiflexion. Furthermore, we performed comparison during same each exercise. One person could not evaluate but excepted.

We compared with the number of times of exercise between the 1\textsuperscript{st} and 2nd of the motivative exercise and passive exercise of Knee joint flexural extension and ankle joints plantar flexion and the dorsiflexion.

The number of times evaluation of movement compared the first time and the 2nd numerical value which the investigator counted the number of times of exercise, and recorded it at the time of a fNIRS examination.

We authorized the significant difference by SPSS15.0.

Result
Comparing change of the oxyhemoglobin of the motivative exercise and passive exercise, we verify the brain activated more in the Motivative exercise to affected. (P<0.05)

Comparing change of the first time evaluation and the second, we verify the 2nd evaluations had less change than first time evaluation. (P<0.05) In addition the significant difference was not seen by passive exercise of ankle joints plantar flexion and the dorsiflexion.

Comparing change of the number of times of exercises between the first time evaluation and the second, we verify the 2nd evaluations had more number of times of exercises. (P<0.05)

The threshold in motor cortex to activate movements might decrease by repeated active assisted exercise using Motivative exercise. These phenomenon are seemed to coincide motor adjustments.

Conclusion
We inferred that the number of elderly people in Japan have increased rapidly, over 25% in population. The degrees of care are aggravating worse and worse. The balance of Japanese long term care insurance has been in red already. To confront these facts, Motivative exercise could help to aging crisis. Between these researches, the degree of care was changeless in the space of a year and considered expression of the motivative exercise introduction result. The lower limbs muscular strength reinforcement seems to be presumed by the use for one year from findings.

Moreover, although my keynote lecture described the old result of research, we consider that we have realized a part of mechanism research which realizes the effect.

Key words, Motivative exercise, functional improvement, secular Change