0469

Preliminary study on a new system for assessing the upper limb and the finger functions in handwriting

Sonomi Nakajima, Yasuhito Sengoku, Toshio Ohyanagi, Yuji Nakamura
Spporo medical university, Sapporo, Hokkaido, Japan

< Introduction>One of the main goals of occupational therapy for children with developmental disorder is to improve their upper limb and finger functions in writing and drawing (handwriting). In the previous studies, their abilities in handwriting have assessed by analyzing a static aspect of their way of grasping writing materials or developmental characteristics of a dynamic aspect of the accuracy in conducting the tasks. We developed a new system for assessing the upper limb and finger functions. The system records the trajectory and pen pressure in handwriting.

< Objectives > In this study, we present preliminary experimental results of assessing the upper limb and the finger functions of participants obtained by using our new system.

< Methods>The subjects were 3 healthy adults and a child with developmental coordination disorder. The system consisted of a PC, a pen tablet, newly developed two tasks, and software for presenting the tasks and for recording the trajectory and pen pressure in handwriting. The first task was to draw a line within parallel lines of double triangle that required the high skilled control. The second one was to write a Hiragana character "あ" inside of a square that required the lower skilled control.

< Results> The change of velocity and pen pressure in handwriting during conducting the first task showed similar patterns among 3 adults. During drawing a line along with one side of the triangle, the velocity increased from the beginning and decreased from about the middle of the line. Regarding the change of pen pressure in handwriting, it increased suddenly from the beginning. Then it continued increasing gently and decreased suddenly just before completion of the task. The similar results of the change of velocity and pen pressure were obtained from 3 adults for the second task. The change of velocity in handwriting obtained from the child with developmental coordination disorder did not show the similar pattern. In addition, the change of pen pressure obtained from the child showed a different pattern from that from 3 adults.

< Conclusion> These results suggest that the new system could measure various functions in handwriting simultaneously.