Clinical Study on Motor-development Tuina Therapy for Infantile Cerebral Palsy

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Abstract
Objective: To quantify the effect of motor-developmental Tuina therapy on 61 children with cerebral palsy. Methods: All the children received the motor-developmental Tuina therapy for 20 min each time, 3 to 6 times per week. The gross motor functions of the children were evaluated by GMFM 66. The baseline period evaluations in 15 children and follow-up period evaluations in 26 children were performed. Results: GMFM 66 score significantly increased at the end of treatment period (P< 0.001). The GMFM 66 score changes per month in treatment period was significantly greater than those of both baseline period and follow-up period (P< 0.001). Conclusion: The effect of motor-developmental Tuina therapy was notable on children with cerebral palsy. Continuous progress of the gross motor functions in these children may be obtained by continuous therapy.

Key Words: Cerebral Palsy; Tuina; Massage

Clinical Materials

1. Diagnostic criteria

In conformity with the criteria[4] stipulated by national seminar on infantile cerebral palsy in 1988, the patterns were classified gradually by the practitioners during the treatments.

2. General materials

Group A: From January of 2003 to June of 2004, 61 cases of the sick children with cerebral palsy have accepted the motor-development massage therapy in our center, including 45 boys and 16 girls, with the age ranging from 5 months to 61 months, at the average age of 19.9 ± 10.0 months.

Group B: Before the treatment by this method in Group A, there had been a baseline evaluation over one month, totally 15 cases, including 14 boys and 1 girl. The baseline evaluation refers that the sick children did not accept the motor-development Tuina therapy in this period, but were permitted to accept other therapies, by exclusion of other diseases during this period.

Group C: For the sick children, in Group A, who stopped the treatment due to various reasons after treatments for 2 to 3 months, we have conducted follow-up observation on them, totally 26 cases,
including 24 boys and 2 girls.

During the follow-up observation, the sick children were not treated with this method, but were permitted to accept other therapies and other diseases were excluded during this period, too. After follow-up observation, out of 26 cases, 15 cases continued with the treatments and another 11 cases stopped treatment.

For general situations of various groups of the sick children, please see Table 1. During the evaluation, treatment and follow up, no surgical treatment or medications to relieve muscular spasm were given.

Table 1. General situation of sick children in various groups

<table>
<thead>
<tr>
<th>Groups</th>
<th>N</th>
<th>Spastic four-limb palsy</th>
<th>Spastic double palsy</th>
<th>Spastic hemiplegia</th>
<th>Athetoid spasm</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>61</td>
<td>26</td>
<td>23</td>
<td>6</td>
<td>6</td>
</tr>
<tr>
<td>B</td>
<td>15</td>
<td>6</td>
<td>7</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>C</td>
<td>26</td>
<td>15</td>
<td>5</td>
<td>2</td>
<td>4</td>
</tr>
</tbody>
</table>

3. Evaluation methods

The evaluation was performed by gross motor function measure (GMFM). Based upon the original GMFM 88 items, the designer of GMFM scale established GMFM 66 items by Rasch analysis. After Rasch analysis, there are the following features in GMFM 66 items: a. The order of the difficulty degree was established in the testing items. b. The interval feature of equal division in the ability scores can enhance the understandability of the ability scores and changed scores. c. Some improper items were omitted to elevate the single dimension in evaluation. d. It is in conformity with trustfulness, effect and reaction in significance of psychological determination. GMFM 66 items have enhanced the understandability of the total score and changed score, and can properly and objectively reflect the changes in the gross motor development in the children sick with cerebral palsy.

The evaluation was conducted by three designated doctors and practitioners. The previous evaluation results were not referred to during this evaluation. The scores of GMFM 66 items can be obtained after the results were put into Gross Motor Ability Estimator (Version 1.0, 2002) software. The evaluation environment was set up in a quite, independent and better daylight room, with the room temperature controlled between 20°C and 30°C, and with the sick children in 1 to 2 layers of clothes. Under the condition without offending the evaluation requirements, same family members would be permitted on the spot in each evaluation, to encourage the sick children to do their best.

The determination of trustfulness and effect in this evaluation method was as follows: a. Determination of Trustfulness: 20 cases of the sick children with cerebral palsy were re-evaluated, with the interval within three days. The results in re-evaluation in same subject were highly correlated, and the interclass correlation coefficient (ICC) = 0.9354. The results of the evaluation in different subjects were also highly correlated, and ICC = 0.9753. b. Determination of Differential Effect: In the paired t-test of the scores of GMFM 66 items before and after the baseline period in 15 sick children in Group B, with the baseline interval in 1.31 ± 0.58 months, there were significant difference between them, t = 1.95, P< 0.05.

We have conducted the evaluation on the sick children before and after the baseline period and follow-up period, and conducted the evaluation on the sick children under continuous treatments once every three months.

Therapeutic Methods

1. Spastic cerebral palsy

   a. Supine position: One-thumb pushing method and palm pressing and kneading method were applied on the medial and lateral aspects of the lower limb, with proper force intensity. Then, in a status to maintain a normal position of the joints and muscles, the pulling method and shaking method were used to enhance the activity of the joints gradually, and at the same time, to stretch the spasmodic muscles and tendons, mainly focusing on the hip joint, knee joint and ankle joint, plus the shoulder joint, elbow joint and wrist joint in those with dysfunctions in the upper limbs. For those sick children with poor controlling ability, the practitioners could ask the sick children to take an inverted supine position, regulated and supported in the different locations, to promote the sick children to accomplish the getting-up action from different directions and by different ways, with attention paid to the regulation of the status of the abdominal muscles in particular, including the straight muscle and oblique muscle of the abdomen.

   b. Prone position: In a sitting position, the practitioner held the two lower limbs of the sick child on the two thighs of the practitioner and applied the manual techniques on the posterior aspect of the lower limb by one-thumb pushing method, pressing and kneading method and rolling method, mainly focusing on the flexor muscles of the knee joint, heel tendon and sole, plus around shoulder joint in those with dysfunctions in the upper limb, in order to