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The Effect of Activities of Daily Living (ADL) Instructions to Rheumatoid Arthritis Patients

Ryuichi Saura', Chieko Itoh2, Minoru Doita', Kosaku Mizuno3, and Hitoshi Ishikawa'

In order to investigate the protective effect of the activities of daily living (ADL) instructions against the developing and progression of joint deformity observed in the rheumatoid arthritis (RA) patients, 34 RA patients were reviewed average 22.4 months after the initial guidance. Instructed ADLs are composed of 18 different kinds of activities such as the safety way to stand up with assistance. With regard to the acceptance, 78% of total patients were satisfied with these instructions and 60% have expected to prevent the progress of the joint deformity due to RA after 6 month follow-up periods though this guidance did not affect the disease activities of RA. At the one year follow up period, half of the un-deformed joints (Steinbrocker stage II) yield to the joint subluxation, which indicates that they can not always inhibit the progression of joint deformity of RA patients consequently. In early RA patients, however, the extent of the articular destruction of wrist joints measured by the decreasing of carpal height ratio (CHR) were relatively smaller than those of late stage of RA patients. These results suggest that when the instructions of ADLs for the RA patients were applied as soon as possible after their disease onset, they might be effective for the delay of joint destruction due to arthritis even though they could not stop the progress of joint deformity completely.

Key Words
Rehabilitation.
Rheumatoid arthritis,
Activities of daily living,
Joint deformity,
Patient education,

Introduction

Rheumatoid arthritis (RA) is considered to be a chronic inflammatory disorders accompanied by both inflammatory cell infiltration and synovial cell proliferation. Due to the destruction of articular cartilage and subchondral bone by the pronounced synovial hyperplasia, joint functions are deteriorated.

It is also reported that mechanical forces involved in using the joints such as hands where bony erosion is present leads to progression of the joint deformities1-2). Therefore, immobilization or physical rest has been reported to be beneficial in the treatment of the patients with RA3-4). However it is shown that maintaining physical activities combined with the judicious use of corticosteroids resulted in as good or probably better outcome than a regimen of bed rest and no steroids for 10 years5). Thus, it still remains controversial that the role of
joint exercises in rehabilitating the patients with RA. We have, therefore, postulated that the patient education (the guidance of the activities of daily living (ADLs) instruction) are required for the preventing of joint deformities and maintaining of the joint function in addition to the pharmacological treatment.

In the present study, we have examined the protective effect of the guidance for the patients with RA concerning the ADLs instruction against the joint deformity.

Subjects and methods

Thirty-four female patients with RA according to the criteria of the revised American Collage of Rheumatology in 1987, all of whom had mild-to-moderate disease activity, were enrolled in this study (Table 1). The patients were selected consecutively from the outpatient rheumatology clinic at Kobe University Hospital (KUH) after informed consent. The average age of the patients was 45 years (range 27–69 years) and the average observation period was 22.4 months (range 13.5–24.8 months) after the initial guidance for ADLs instruction. Pharmacological treatment has remained unchanged during this study. Guidance of recommended ADLs for protecting joint deformity were performed by the same occupational therapist as following RA patient educational program in KUH.

Patient educational program are composed of both active range of motion (ROM) exercise and guidance of recommended ADLs, which contains 18 different kinds of activities including the safety way to stand up with self-assistance, to clean up the floor avoiding the ulnar bending, to open the door using their hands, to squeeze the towel utilizing the water tap, to carry the bag using their own shoulder and to hold the teacup with their both fingers and palm. At 6 months after first patient guidance, acceptances of the patient for this patient educational program were evaluated by the interview for 32 of total patients. Be-

<table>
<thead>
<tr>
<th># No. of Patients:</th>
<th>34 patients (no male)</th>
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<tr>
<td># Age:</td>
<td>ave. 44.9 y.o. (range 27-69)</td>
</tr>
<tr>
<td># Disease duration before guidance:</td>
<td>ave. 5.0 years (range 0.37-17)</td>
</tr>
<tr>
<td># Observation periods after initial guidance:</td>
<td>ave. 22.4 MO. (range 13.5-24.8)</td>
</tr>
<tr>
<td># Radiographic classification of RA patients.</td>
<td>(Steinbrocker classification)</td>
</tr>
<tr>
<td>Stage I: 17 pts.</td>
<td>Stage III: 7pts.</td>
</tr>
<tr>
<td>Stage II: 6 pts.</td>
<td>Stage IV: 4pts.</td>
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</table>
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fore and every 6 months after first guidance, Steinbrocker damage scale\(^7\) of the bilateral wrist joints (68 joints) of all the 34 patients were evaluated rentogenographically and carpal height ratio (CHR) and carpal–ulnar distance ratio (CUDR)\(^8\) were also calculated for detecting the extent of the destruction of wrist joint.

Statistical analysis were carried out with regard to the change of CHR or CUDR for 12 months by a Mann–Whitney U test. \(P\) values less than 0.10 were considered significant statistically seen.

**Results**

In terms of the acceptance for patient education program, 25 patients (78.1%) were satisfied with this guidance of ADL instructions after first 6 month follow–up periods (Fig. 1). Out of these 32 patients, 22 patients (68.8%) continued to keep this guidance for ADLs instruction. More than half of 32 patients (68.8%) seemed to get relief from their pain and 21 patients (65.1%) have expected to prevent the progression of the joint deformity due to RA (Fig. 2).

Thus, total satisfaction of this guidance of ADLs instruction for patients was enough to accept, whereas the performance rate varied from item to item. Some items such as squeezing towel using water tap were hardly kept to perform in comparison with to clean up the floor avoiding the ulnar bending or to carry the baggage using their own shoulder (Fig. 3).

During 12 months after initial patients education for preventing of the joint deformity, the performance of these ADL instructions did not affect the disease activities of RA (data not shown) because pharmacological treatment has remained unchanged during this study. In order to investigate the effect of this guidance, Steinbrocker damage scale of the bilateral wrist joints (68 joints) of all the 34 patients were evaluated rentogenographically. Also the CHR and CUDR were calculated before and every 6 months after

**Fig. 1** Acceptance and satisfaction rate of the patient education. Patient satisfactions were evaluated by the interview at 6 months after first instruction. 78% of 32 patients were satisfied and 68.8% continued these instructions after first 6 month follow–up periods.
How is your pain?

<table>
<thead>
<tr>
<th>Decrease</th>
<th>More or less</th>
<th>No change</th>
<th>No answer</th>
</tr>
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<tbody>
<tr>
<td>9 (28%)</td>
<td>13</td>
<td>6</td>
<td>4</td>
</tr>
</tbody>
</table>

Hopefully, yes  Yes, but a little  More or less  No effect

Protect your joint?

| 8 (25%)  | 13 (40.1%) | 7 | 1 | 3 |

Fig. 2 Effect of the patient education and patient expectation for preventing the joint deformity. Patient expectation was also evaluated by the interview at 6 months after first guidance. More than half of the patients (68.8%) have felt pain relief and expected to prevent the progression of the joint deformity due to RA.

Fig. 3 The performance rate of keeping the recommended ADLs included in patient educational program. The performance rate of keeping the recommended ADLs was evaluated by the interview at 6 months after first guidance. They varies from item to item. Some item such as squeezing towel using water tap were hardly performed comparing to cleaning up the floor or carrying the baggage.

first patient education and the extent of the joint destruction was evaluated.

As a results, one third of the non-de-destroyed wrist joints (Steinbrocker stage I ; n=41) were suffering from the erosions and half of the un-deformed joints (Steinbrocker stage II ; n=12) yield to joint subluxation after 12 months (Fig. 4).
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In terms of the ulnar deviation, the change of CUDR during 12 months has been improved in the group of RA patients with non-destroyed wrist joints (Steinbrocker stage I) as compared with that in the group with un-deformed wrist joints (Steinbrocker stage II : $p=0.036$ vs. stage I). However, there is no statistical significance of this average change of CUDR between the group of RA patients with non-destroyed wrist joints and the group either with deformed wrist joints (Steinbrocker stage III : $p=0.56$ vs. stage I) or with ankylosing wrist joints (Steinbrocker stage IV : $p=0.61$ vs. stage I).

The decrease rate of the CHR during 12 months in the group with non-destroyed wrist joints (Steinbrocker stage I) was statistically smaller than that in either with deformed wrist joints (Steinbrocker stage III : $p=0.030$ vs. stage I) or with ankylosing wrist joints (Steinbrocker stage IV : $p=0.087$ vs. stage I).

The group with un-deformed wrist joints (Steinbrocker stage II : $p=0.52$ vs. stage I) demonstrated no significant difference of the CHR decreasing for 12 months statistically comparing with non-destroyed wrist joints. (Fig. 5).

Consequently, it is revealed that the guidance of ADL instructions could not always inhibit the progression of the Steinbrocker damage scale of the patients with RA rentogenographically after 12 months. However, as shown in figure 5, the extent of the articular destruction of the wrist joints of early RA patients (Steinbrocker stage I or II) were relatively slower than those of late stage of RA patients (Steinbrocker stage III or IV).

**Discussion**

It is recently reported that the admini-
Fig. 5 Changes in average of carpal height ratio (CHR) and carpal-ulnar distance ratio (CUDR) before and after every 6 months of patient education.

Both CHR and CUDR were calculated for detecting the extent of the joint destruction. In terms of the ulnar deviation, the change of CUDR per 12 months has been improved in the group with non-destroyed wrist joints (Steinbrocker stage I) as compared with that in un-deformed wrist joint group (Steinbrocker stage II: p =0.036 vs. stage I). However, there is no statistical significance of this change of CUDR between the group of RA patients with non-destroyed wrist joints and the group either with deformed wrist joints (Steinbrocker stage III: p=0.56 vs. stage I) or with ankylosing wrist joints (Steinbrocker stage IV: p=0.61 vs. stage I).

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It is suggested as an etiologic factor that the mechanical stress involved in using the joints such as hands and wrists where bony erosion is present leads to progression of the joint destruction. Though the role of joint exercises in rehabilitating the RA patients still remains controversial, we have applied the patients education including active ROM exercise and guidance of recommended ADLs for preventing of joint deformities and maintaining of the joint function in addition to the pharmacological treatment.

With regard to the acceptance of patient education, many patients were satisfied with this guidance and continued to keep the recommended ADLs after first 6 month follow-up periods. Thus, this...
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guidance seemed to be useful for RA patients. However, the performance rate of each recommended ADLs varied from item to item. Some items such as squeezing towel using water tap were hardly kept to perform comparing with cleaning up the floor to avoid the ulnar bending. Those items seem to be complicated and tiresome for the RA patients to keep them in ADLs. In order to let RA patients understand the significance of the guidance and keep to continue these recommended ADLs, comprehensible guidance should be prepared for each patients.

In this study, CHR and CUDR were detected for evaluating the extent of deformities such as carpal shortening or ulnar deviation. Hand functional scales such as grip power or ROM of each finger joints were not measured in this study. However, both CHR and CUDR are probably an indirect measure of the hand function of RA patients. Rентogenographically, Steinbrocker stage of the wrist joints were worsening in spite of the guidance of ADL instructions in all stages. Though the effect of the guidance of ADL instructions was still unclear in terms of the improvement of the ulnar deviation, extent of the joint destruction (carpal shortening) indicated by the change of CHR has been made slow in the group of RA patients with non-destroyed wrist joints (Steinbrocker stage I ) and un-deformed wrist joints (Steinbrocker stage II ) in comparison with that in other groups (Steinbrocker stage II or III). Though controlled prospective study should be required, these results suggests that patient education seems to be beneficial in delaying the progression of joint destruction rentogenographically in early RA patients (Steinbrocker stage I or II ), whereas it could not always protect the functional property of the affected joints.

In conclusion, it is revealed that when the patient education including the guidance of recommended ADLs against the joint deformity were applied for RA patients as soon as possible after their disease onset, they might be contribute to prevent or delay the progression of the joint destruction or deformity due to RA.

References