Improvement of functional independence of patients with acute schizophrenia through early occupational therapy: a pilot quasi-experimental controlled study

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博士論文

Improvement of functional independence of patients with acute schizophrenia through early occupational therapy: a pilot quasi-experimental controlled study

（早期作業療法による急性期統合失調症患者の機能的自立度の改善：パイロット準対照試験研究）

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Abstract

Objective: To clarify whether early occupational therapy for patients with acute schizophrenia improves their functional independence in schizophrenia patients.

Design: Quasi-experimental controlled study.

Setting: A university hospital in Japan.

Subjects: Forty-six out of 85 eligible patients with schizophrenia.

Intervention: Participants were allocated into an intervention group or a control group according to the month of admission. Activities in one-on-one and mainly non-verbal occupational therapy were provided for the intervention group immediately after admission, and not for the control group.

Main measures: Functional independence was measured using the functional independence measure, at admission, at 1 month and at 3 months after admission. Psychiatric symptoms were also measured by the Brief Psychiatric Rating Scale.

Results: Patients in both groups showed improved FIM total scores at 1 month and 3 months after admission. In the intervention group, the medians (IQRs) were 89.0 (44.5) at admission, 113.0 (18.5) at 1 month and 121.0 (6.5) at 3 months. In the control group, they were 88.0 (32.0), 107.0 (39.5), and 111.0 (17.0). At 3 months, the total FIM scores were significantly higher in the intervention group than in the control group ($p=0.016$). In the FIM cognitive domain, the scores

were significantly higher in the intervention group than in the control group at 1month (p=0.038) and, 3 months (p=0.012). Both groups showed improvement in BPRS total scores, while no significant differences were observed between the groups at any points.

Conclusion: The results suggest that early occupational therapy may improve functional independence in patients with acute schizophrenia.

Keywords

Occupational therapy, schizophrenia, quasi-experimental controlled study, functional independence, acute psychosis

Introduction

Early rehabilitation interventions are well known to produce greater improvement in functional outcomes in patients with acute physical disorders.[1, 2] Patients with chronic (but not acute) mental disorders have been successfully treated with occupational therapy, as a form of psychosocial therapy.[3-5] In Japan, occupational therapy has been recently tried in an attempt to improve the functioning of patients with acute mental disorders,[6] but the evidence of the feasibility and effects of occupational therapy are still limited. There have been no controlled clinical trials investigating the effect of early intervention with occupational therapy in people with acute psychosis.

Acute schizophrenia patients suffer from marked thought disorder, confusion, agitation, and impulsivity.[7] Although cognitive behavioral therapy and psychoeducation are known to be effective for patients with schizophrenia,[8, 9] linguistic stimuli can sometimes aggravate symptoms in acute patients,[7] and psychosocial therapy based on complex linguistic stimuli cannot be applied easily.[10-14] Safe treatment methods for acute schizophrenia patients are necessary for both patients and staff.[15, 16] A flexible treatment structure, one-on-one can help the staff to respond to crisis situations such as a sudden deterioration in symptoms.[7] In this study, we conducted early occupational therapy for patients with acute schizophrenia , which has two main characteristic features: a one-on-one structure and a non-verbal approach.

The aim of this study was to investigate whether early occupational therapy for patients with acute schizophrenia immediately after hospital admission is feasible and improves functional independence in patients with acute schizophrenia, using a quasi-experimental controlled trial.

Methods

The study was conducted at a psychiatric inpatient unit of university hospital in Japan. A total of 394 patients were admitted to the inpatient unit from February 2008 to March 2010. All patients who were admitted with an acute psychosis diagnosed as schizophrenia or schizoaffective disorder according to the International Statistical Classification of Diseases and Related Health Problems, Tenth Revision were considered eligible for the study. The participants were pseudo-randomly divided into two groups according to the month; the patients who were admitted in the even-numbered months received the early occupational therapy (intervention group), while the patients who were admitted in odd-numbered months did not receive the early occupational therapy (control group). Patients received all services as usual whether they chose to participate or not. The study was performed in accordance with the Helsinki Declaration. This study was approved by the ethics committee at Kobe University Graduate School of Medicine (permit number: 633).

The early occupational therapy and conventional occupational therapy are described in Table1. According to the occupational therapy objectives for patients with psychiatric disorders,[17] both early occupational therapy and conventional occupational therapy were provided the patients with the opportunities to improve task performance and cognitive disorganization, and to rebuild and sustain partnerships with others. The early occupational therapy was conducted in one-on-one and mainly non-verbal approaches. Complete descriptions of the early occupational therapy are given in the Appendix. In the early occupational therapy, the simple structured activities were done when a patient was able to express his/her preferences for activities. In a case where psychiatric symptoms were severe and the patients could not express their preferences, simple exercises were done. Multidisciplinary team members evaluated the severity of the symptoms such as self-harming and violent behaviors to determine the start time of the early occupational therapy. According to their suggestions, the early occupational therapy was provided to intervention group immediately after admission or within 1 month at the latest (Figure 1). At 1 month after admission, conventional occupational therapy was done as usual for both groups. We did not control each group with the types and dose of antipsychotic drugs because this study was conducted in the real world setting.

The following measurements were used to assess the effects of the early occupational therapy intervention at admission, at 1 month, and at 3 months after admission or at discharge, if

within 3 months (Figure 1).

The functional independence measure (FIM) was used to assess the functional status of activities of daily living (ADL).[18, 19, 20] The ratings were obtained from the observations of nurses and occupational therapists as well as from patient interviews and medical records. The multidisciplinary team members, including the attending psychiatrist, nurse, occupational therapist, and psychiatric social worker, confirmed the rating. In addition, the objectivity of the FIM assessments was ensured by the supervision of a senior nurse who was not involved in this study.

The Brief Psychiatric Rating Scale (BPRS) is widely used as a simple and comprehensive scale for assessing psychiatric symptoms. The scale includes positive, negative, and emotional symptoms; a total of 18 items are assessed on a 7-point scale ranging from no symptoms (1 point) to extremely severe symptoms (7 points).[21, 22] Measurements were performed by psychiatrists who were blinded to allocation of participants to groups.

The background data of the participants in the 2 groups were compared with a chi-squared test, *t*-test, or Mann–Whitney *U* test. Participant drop-out rates were analyzed using Fisher's exact test. For FIM and BPRS ratings, scores of the intervention and control groups were compared between the 2 groups using the Mann–Whitney *U* test. Comparisons within the respective groups of FIM and BPRS scores between at admission and 1 month, or at admission

and 3 months were made using the Wilcoxon signed-rank test. PASW Statistics 18 for Windows (SPSS Japan, Tokyo) was used for all statistical analyses.

Results

Of the 394 patients with mental disorders admitted to our hospital, 85 were considered eligible for the study (Figure 2). The intervention and control groups were not significantly different with respect to sex, age, age at onset, number of hospitalizations, duration of illness, or medication dose (Table 2). No significant difference was observed in the drop-out rates between the intervention group (11.5%) and the control group (10.0%) ($p=0.627$, by Fisher's exact test) (Figure 2).

The functional independence measure (FIM) total scores of the 2 groups were not significantly different at the time of admission. In both groups, the FIM total scores were significantly higher at 1 and 3 months than at the time of admission. While the FIM total scores between the 2 groups were not significantly different at 1 month, the intervention group showed significantly more improvement than the control group at 3 months. Improvement in the FIM cognitive domain scores was significantly greater in the intervention group than in the control group at 1 month and 3 months. The FIM motor domain scores between the 2 groups were not significantly different at any points (Table 3).

The BPRS total scores of the 2 groups were not significantly different at admission. The

BPRS total scores were significantly improved in both groups at 1 month and 3 months after admission, while the two groups were not significantly different at any points (Table 3).

We found no significant differences in the number of patients who were discharged within 3 months (7 in the intervention group and 4 in the control group, p=0.149, by Fisher's exact test).

Discussion

Improvement in FIM cognitive domain scores was significantly greater in the early occupational therapy group than in the control group at 1month and 3months, while no significant difference in FIM motor domain scores was observed between the two groups at any points. The biggest effects were found in the FIM cognitive domain, including some items such as expression and social interaction. The improvement of FIM cognitive domain scores suggests that the early occupational therapy helps patients with acute schizophrenia to improve their communication and social cognition skills with lower levels of assistance.

The FIM total score was significantly higher in the intervention group than in the control group at 3 months. This result suggests that the early occupational therapy has a greater capacity to improve functional independency in patients with acute schizophrenia than the usual treatment without the early occupational therapy. Many studies have reported that patient functioning plays an important role in the course and outcome of schizophrenia.[23-27] Therefore,

our findings suggest that the early occupational therapy contributes to the recovery process of schizophrenia through the improvement of functional independence.

The lack of a difference in the FIM motor domain scores between the two groups was not surprising. The patients with acute schizophrenia often show catatonic behaviors[28] and antipsychotic-induced extrapyramidal symptoms.[7] These motor dysfunctions seemed to be more suited to treatment by pharmacotherapy than by early occupational therapy. In addition, this study was done in a real world setting, where both groups received not only pharmacotherapy but the other psychiatric inpatient treatments and cares such as conventional occupational therapy and nursing. The ADL impairments assessed by the FIM motor domain scores might be successfully managed without early occupational therapy.

Both the early occupational therapy intervention and control groups showed a significant improvement in psychiatric symptoms at both 1 month and 3 months (Table3), while no significant difference was found between the two groups at either of these times. No significant difference was observed in the discharge rate between the two groups. These results suggested that the remission of psychiatric symptoms and the discharge from hospital could be induced by the antipsychotic pharmacotherapy common to the two groups. However, some of the functions of schizophrenia patients cannot be improved by antipsychotic pharmacotherapy.[29] Thus, the results of this study suggest that early occupational therapy should be considered as an

adjunctive therapy to pharmacological treatment to improve functional independency in patients with acute schizophrenia.

In this study, the drop-out rates of two groups were not significantly different, and no adverse events such as cases of patients harming themselves or others were found. Our results suggest that early occupational therapy is feasible and that the structure of one-on-one and non-verbal approaches might assure the feasibility. In addition, evaluation of patients' conditions by a multidisciplinary team might increase the early occupational therapy feasibility.

It is unclear why the intervention group show improvement of FIM total scores compared to the controls at 3 months but not at 1 month. One possibility is that an initial therapeutic alliance promotes treatment adherence.[7, 15, 16] The one-on-one structure of early occupational therapy should facilitate the alliance easily between a patient with acute schizophrenia and a therapist. Thus, the treatment structure might have led to subsequent treatment adherence resulting in a latent improvement of the FIM total score.

This study has several limitations. The study was conducted at a single hospital, and the sample size was small. Among the patients with acute psychosis diagnosed as schizophrenia and schizoaffective disorder, some did not consent to being in the study and others were unable to consent because of the severity of their disease. The limited representativeness of the subjects in this study might restrict the generalization of the findings. Although we attempted to blind the

raters for psychiatric symptoms to which group the subject were in, we could not rule out the possibility that in some cases they accidentally knew which group they were in. The methods for evaluating FIM in this study could not completely rule out the possibility of experimenter bias. We could analyze only 39 out of 85 eligible patients. To confirm the effect of early occupational therapy for patients with acute schizophrenia, it will be necessary to conduct a randomized controlled trial at multiple medical facilities with approximately twice the sample size used in the present study. To aid the patients to transition smoothly to, and live more independently in, the community, we also need to follow up the patients after 6 months to determine the long- term effects of early occupational therapy for acute schizophrenia.

Clinical messages

・Early occupational therapy characterized by one-on-one and non-verbal approaches was feasible for patients with acute schizophrenia.

・The early occupational therapy improved functional independence in patients with acute schizophrenia.

・The cognitive domain was greatly affected by the early occupational therapy, indicating that it might benefit most patients with acute schizophrenia.

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Table 1. Early occupational therapy for patients with acute schizophrenia (E-OTAS) and conventional occupational therapy (C-OT)

	E-OTAS	C-OT
Start time	immediately after admission	1 month after admission
Type	one-on-one (patient and occupational therapist)	group
Main activities	simple structured activities, simple exercises	standard OT activities
Communication	mainly non-verbal	verbal and non-verbal
Place	inpatient ward (bedside, day room), OT room	OT room, inpatient ward (day room)
Frequency	2–3 times a week	2–5 times a week
Session duration	10–30 min	30–120 min

OT, occupational therapy.

Table 2. Participant characteristics

	Intervention group (n = 22)	Control group (n = 17)
Sex (n)		
Male	9	7
Female	13	10
Age(years)	37.2 ± 13.2	38.4 ± 11.5
Age at onset (years)	22.4 ± 7.9	24.9 ± 7.0
Hospitalizations (n)	4.5 ± 3.9	3.8 ± 2.4
Duration of illness (years)	14.2 ± 9.2	14.1 ± 9.9
Medication dose (CPZ equiv, mg/day)		
At admission	577.2 ± 382.3	755.6 ± 360.2
At 1 month	702.7 ± 369.7	928.8 ± 474.6
At 3months	796.4 ± 483.9	951.0 ± 467.2
Pre-OT interval (days)	9.9 ± 6.2	30

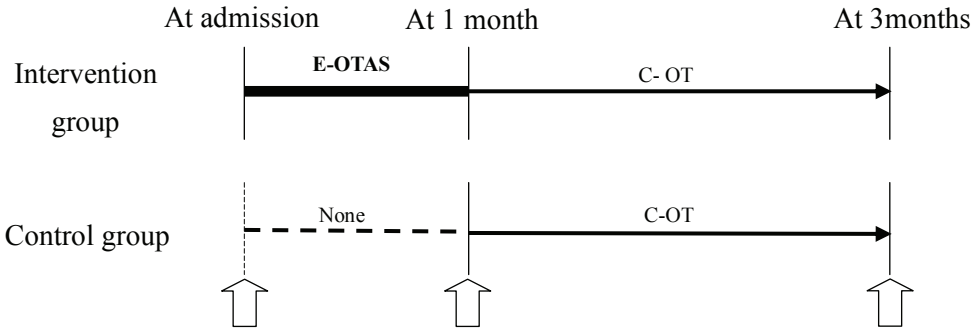
Mean ± SD

CPZ, chlorpromazine ; equiv, equivalence; OT, occupational therapy.

Table 3. Functional Independence Measure and Brief Psychiatric Rating Scale scores for the intervention and control groups

	Intervention (n = 22)	Control (n =17)	
	Median(IQR)		*p*
Functional Independence Measure			
At admission	89.0 (44.5)	88.0 (32.0)	0.301
At 1 month	113.0 (18.5)#	107.0 (39.5)#	0.133
At 3 months	121.0 (6.5)#	111.0 (17.0)#	0.016 *
Motor domain			
At admission	79.0 (27.0)	76.0 (25.0)	0.63
At 1 month	86.5 (8.3)#	84.0 (25.0)#	0.44
At 3 months	90.0 (5.3)#	87.0 (8.5)#	0.107
Cognitive domain			
At admission	22.0 (17.8)	14.0 (10.5)	0.148
At 1 month	27.5 (7.5)#	23.0 (12.5)#	0.038*
At 3 months	30.0 (5.5)#	26.0 (7.0)#	0.012*
Brief Psychiatric Rating Scale			
At admission	47.5 (17.5)	52.0 (14.5)	0.129
At 1 month	37.0 (14.3)#	45.0 (20.5)#	0.257
At 3 months	33.5 (16.8)#	40.0 (29.0)#	0.161

*$p < 0.05$, significant difference between the 2 groups (Mann-Whitney U test).
#$p < 0.05$, significant difference from at admission (Wilcoxon signed rank test).
IQR, interquartile range.



E-OTAS, early occupational therapy for patients with acute schizophrenia; C-OT, conventional occupational therapy

Figure 1. Interventions and assessments

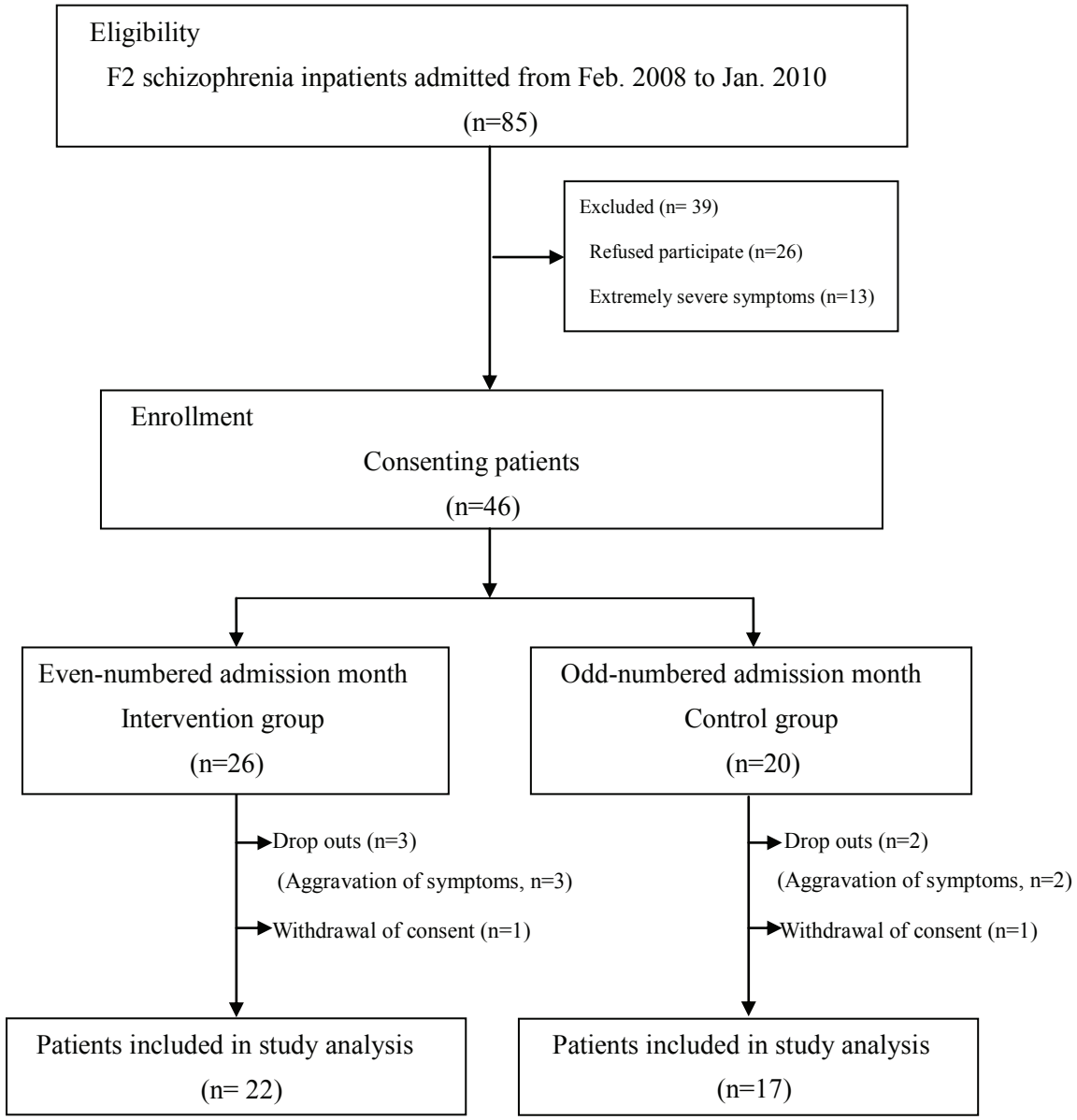


Figure 2. Participant status

Appendix: Early occupational therapy for patients with acute schizophrenia and conventional occupational therapy

In Japan, psychiatric occupational therapy has been used primarily for long-stay inpatients in medical settings. Recently, Japan's government policy on mental health services has been shifting from hospital-centered to community-based (http://www.ncnp.go.jp/nimh/keikaku/vision/index_e.html). Therefore, hospitals emphasize short discharge time, and it is now necessary to begin psychiatric occupational therapy earlier than in the past. We developed the early occupational therapy from conventional occupational therapy and used it for acute patients with schizophrenia.

During early occupational therapy, we emphasized the following: (1) carefully monitoring the unstable states, such as marked thought disorder, confusion, agitation, and impulsivity, of patients with schizophrenia; (2) obviating the risk of symptomatic exacerbation; (3) paying attention to the recovery of patients' body sensation. The objective of early occupational therapy is to improve functional independence in patients with acute schizophrenia. Below are the specific descriptions of early occupational therapy in comparison to conventional occupational therapy used in this study.

Start time: We began early occupational therapy immediately after hospitalization. Even when a patient had acute symptoms, we began the therapy as early as we could as long as the safety of the patient and the occupational therapist was maintained. Conventional occupational therapy was provided after the acute symptoms disappeared.

Type: The occupational therapist worked one-on-one with each patient during early occupational therapy. In contrast, conventional occupational therapy was provided in groups.

Main activities: During early occupational therapy, we used simple exercises (e.g. stretching and walking), activities with simple structures (e.g. picture colouring and origami) and basic activities of daily living consisting of self-care tasks. During conventional occupational therapy, we used sports, activities with various structures (e.g. arts and crafts) and instrumental activities of daily living (e.g. preparing meals and managing medication).

Communication: During early occupational therapy, we kept verbal communication to a minimum and focused on non-verbal communication. During conventional occupational therapy, we used both verbal and non-verbal communication.

Location: For early occupational therapy, we primarily worked at the patients' bedsides and in the day room in the ward. The occupational therapy room was used only when the patient's condition was stable. We used the occupational therapy room for conventional occupational therapy.

Frequency: We provided early occupational therapy two or three times a week. We provided conventional occupational therapy two to five times a week.

Session duration: We spent approximately 10 to 30 minutes on each session of early occupational therapy. We usually spent approximately 120 minutes on each session of conventional occupational therapy.