Relationship between quality of life and clinical factors in inpatients with schizophrenia

Yoshimune Ishii1, Masahito Tomotake2, Shinichi Chiba2, Rie Tsutsumi2, Masatomo Aono1, and Koushirou Taguchi1

1Department of psychiatry, Jounan Hospital, Tokushima, Japan, 2Department of Mental Health, Institute of Biomedical Sciences, Tokushima University Graduate School, Tokushima, Japan

Abstract: Objective: The purpose of this study was to clarify the relationship between quality of life (QOL) and clinical factors in inpatients with schizophrenia. Methods: Subjects were 50 hospitalized patients with schizophrenia. Their mean age was 56.48 (Standard Deviation=11.93) years. Japanese version of the schizophrenia Quality of Life Scale (JSQLS) and Subjective Well-being under Neuroleptic drug Treatment Short form, Japanese version (SWNS-J) were used to assess subjective QOL, and Mini Mental State Examination-Japanese was used to evaluate cognitive function. Japanese version of the Calgary Depression Scale for Schizophrenia (JCDSS), Brief Psychiatric Rating Scale, and Drug-Induced Extrapyramidal Symptoms Scale were used to assess depression severity, psychotic symptoms, and drug-induced extrapyramidal symptoms, respectively. Stepwise regression analyses were conducted to find factors influencing JSQLS and SWNS-J. Results: JCDSS was a predictor of two scales of JSQLS, and JCDSS also predicted SWNS-J Total and it’s two subscales. However, other clinical factors were not related to JSQLS and SWNS-J. Conclusion: The results indicate that treating depressive symptoms may lead to improvement of subjective QOL in inpatients with schizophrenia.

Keywords: schizophrenia, inpatient, quality of life, depressive symptom, cognitive function

INTRODUCTION

The goal of conventional treatment of schizophrenia has been to improve the psychotic symptoms (1). However, people gradually started to know that it would be sometimes difficult to achieve the goal (2). For example, increasing dose of antipsychotic drugs or using them for a long time to improve psychotic symptoms may cause various side effects such as acute dystonia, akathisia, parkinsonism, tardive dyskinesia, and hyperprolactinemia, which may adversely affect functional status of patients (2, 3). Therefore, therapists need to consider patient’s subjective well-being or quality of function in daily life as well as symptom reduction in the treatment of schizophrenia.

Since the 1980s, research and development of QOL assessment tools have been active (4, 5) and new assessment tools have been made for patients with schizophrenia (4-6). The usefulness of the concept of QOL as a framework for integrating information related to evaluation of services has been investigated (7, 8), and the concept of QOL has gradually expanded from an indicator focused on specific symptoms or diseases to a concept related to treatment outcome. However, because of a variety of scales for QOL evaluation, research results have been inconsistent (4). There are investigations reporting that there is a slight correlation between objective QOL assessed by medical professionals and subjective QOL assessed by patients themselves (8), but there are also reports showing that there is no correlation between them (6, 9, 10). These findings show that it is difficult to assess QOL appropriately (4). Objective QOL reflects function and lifestyle, and it can be used to address service programs more directly, but it is pointed out that it does not consider how patients feel about their lives and patients’ opinions (7). Therefore, recently, subjective QOL has been considered more important because it reflects the patients’ satisfaction with treatment, perceived symptoms, and perceived health conditions (6).

Currently, treatment of patients with schizophrenia is shifting from a hospital-based approach to a community-based approach (11), and the goal of treatment is not only to improve patients’ symptoms but also to improve their QOL in social life from the perspective of enabling them to lead a psychologically and socially healthy daily life even if psychotic symptoms do not disappear completely (11, 12). Therefore, it is crucial to take patients’ subjective QOL into consideration when they are receiving inpatient treatment.

The purpose of this study is to clarify the relationship between QOL and clinical factors in inpatients with schizophrenia.

METHODS

Participants

Fifty inpatients with schizophrenia diagnosis according to the DSM-V (13) who were receiving inpatient treatment in department of psychiatry of Hospital A participated in this study. All participants gave written consent. Patients with organic brain diseases, epilepsy, and serious physical diseases were excluded when recruiting subjects for this study. Data were collected from November 1, 2018 to January 31, 2019.

Instruments

The following reliable and validated rating scales were used in this study.

Japanese version of the Schizophrenia Quality of Life Scale (JSQLS) (14-16)

The JSQLS is a self-report questionnaire that assesses cognition and interest of patients with schizophrenia. It consists of 30 questions and has three scales of Psychosocial (PS),

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Address correspondence and reprint requests to Yoshimune Ishii, Department of psychiatry, Jounan Hospital, 27-1, yukimasa jourokucho, Tokushima 771-4281, Japan and Fax: +81-88-645-0061.
Motivation/Energy (ME), and Symptoms/Side effects (SS). It calculates score for each domain by scoring each item on a scale of 0 to 4 (0; never, 1; rarely, 2; sometimes, 3; often, 4; always), and lower score indicates better QOL. It is reported that the JSQLS has sufficient reliability and validity (16).

Subjective Well-being under Neuroleptic drug treatment (Short form, Japanese version (SWNS-J) (17-19)

The SWNS-J is a self-report questionnaire consisting of 20 question items. It has five subscales: Mental Functioning (MF), Self-Control (SC), Emotional Regulation (ER), Physical Functioning (PF), and Social Integration (SI). Each item is rated on a 6-point scale. Higher score indicates better subjective well-being. It is reported that the SWNS-J has sufficient reliability and validity (19).

Mini Mental State Examination-Japanese (MMSE-J) (20-24)
The MMSE-J evaluates the following abilities: time awareness, place awareness, memorization, attention and calculation, replay, calling, recitation, comprehension, reading, writing, and drawing. When all responses are correct, the total score is 30 points (22, 23). Higher score shows better cognitive function. It is reported that the MMSE-J has sufficient reliability and validity (22, 23).

Japanese version of the Calgary Depression Scale for Schizophrenia (JCDSS) (25-27)
The JCDSS is a semi-structured interview instrument designed to assess severity of depression in patients with schizophrenia. It consists of eight question items and one observation item. Each item is scored on a scale of 0 to 3, and higher score indicates severer depression level (25, 26). The JCDSS has sufficient reliability and validity (27).

Brief Psychiatric Rating Scale (BPRS) (28-31)
The BPRS is widely used in research and clinical scene as an assessment scale of psychiatric symptoms. In this study, we used positive symptom subscale to assess suspiciousness, hallucinatory behavior, conceptual disorganization, and unusual thought content, and negative symptom subscale to assess emotional withdrawal, motor retardation, blunted affect, and disorientation (32, 33). Higher score means severer psychotic symptoms (28-31). The BPRS has sufficient reliability (31).

Drug-induced Extrapyramidal Symptoms Scale (DIEPSS) (34, 35)
The DIEPSS is a scale for evaluation of drug-induced extrapyramidal symptoms and consists of eight individual items and one summary item. It is rated on a 5-point scale from 0 to 4. In this study, we used total score of the eight individual items (34, 35). Higher score indicates severer drug-induced extrapyramidal symptoms (34, 35). It is reported that the DIEPSS has sufficient reliability and validity (34, 35).

Data analysis
SPSS for Windows Ver.24 was used for statistical analysis. Shapiro-Wilk test was used to test for normality of the data. Since normality was not found for the scores of SWNS-J SI, MMSE-J, JCDSS, BPRS positive symptom subscale, and DIEPSS, Spearman’s rank correlation coefficient was used for correlation analysis. False discovery rate correction was done to correct significance probability. Stepwise regression analyses were performed using the scores of JSQLS and SWNS-J as dependent variables and the variables showed significant correlations with JSQLS or SWNS-J as independent variables.
### Table 1. Demographic characteristics and results of Shapiro-Wilk test

|                   | Mean (SD) | Median (QD) | p-value |
|-------------------|-----------|-------------|---------|
| N (men/women)     | 50 (22/28) |             |         |
| Age (years)       | 56.48 (11.93) | 58.00 (9.00) | 0.300   |
| Age of onset (years) | 24.60 (9.79) | 22.00 (4.50) | 0.000** |
| Duration of illness (years) | 32.08 (14.16) | 33.00 (11.50) | 0.244   |
| Number of hospitalization | 4.44 (2.03) | 4.00 (1.00) | 0.005** |
| **JSQSL**         |           |             |         |
| JSQSL PS          | 45.03 (16.26) | 44.16 (9.58) | 0.121   |
| JSQSL ME          | 47.30 (14.37) | 46.42 (11.16) | 0.522   |
| JSQSL SS          | 34.93 (14.73) | 32.81 (6.64) | 0.170   |
| **SWNS-J**        |           |             |         |
| SWNS-J Total      | 71.84 (11.92) | 71.50 (7.50) | 0.700   |
| SWNS-J MF         | 13.48 (3.61) | 13.50 (2.50) | 0.431   |
| SWNS-J SC         | 15.04 (3.04) | 15.00 (2.50) | 0.517   |
| SWNS-J ER         | 13.74 (3.30) | 14.00 (2.00) | 0.771   |
| SWNS-J PF         | 15.12 (3.25) | 15.00 (2.00) | 0.125   |
| SWNS-J SI         | 14.46 (3.21) | 14.00 (1.50) | 0.023*  |
| **MMSE-J**        | 24.20 (4.46) | 26.00 (4.00) | 0.003** |
| **JCDSS**         | 5.26 (4.75)  | 5.50 (3.50)  | 0.000** |
| **BPRS**          |           |             |         |
| BPRS positive symptom | 9.64 (3.98)  | 9.00 (3.50)  | 0.040*  |
| BPRS negative symptom | 9.88 (3.23)  | 10.00 (2.50) | 0.188   |
| **DIEPSS**        | 2.70 (2.50)  | 2.50 (2.00)  | 0.000** |

Note: *p < 0.05, **p < 0.01, Shapiro-Wilk test.

Abbreviations: SD, Standard Deviation, QD, Quartile Deviation, JSQSL, Japanese version of the Schizophrenia Quality of Life Scale; JSQSL PS, Psychosocial scale of JSQSL; JSQSL ME, Motivation/Energy scale of JSQSL; JSQSL SS, Symptoms/Side effects scale of JSQSL; SWNS-J Total, Total score of SWNS-J; SWNS-J ME, Mental Functioning subscale of SWNS-J; SWNS-J SC, Self-Control subscale of SWNS-J; SWNS-J ER, Emotional Regulation subscale of SWNS-J; SWNS-J PF, Physical Functioning subscale of SWNS-J; SWNS-J SI, Social Integration subscale of SWNS-J; MMSE-J, Mini Mental State Examination-Japanese; JCDSS, Japanese version of the Calgary Depression Scale for Schizophrenia; BPRS, Brief Psychiatric Rating Scale; DIEPSS, Drug-induced Extrapyramidal Symptoms Scale.

### Table 2. Correlation between JSQSL scores and other clinical variables

| JSQSL          | JSQSL PS | JSQSL ME | JSQSL SS |
|----------------|----------|----------|----------|
| MMSE-J         | -0.382** | -0.295   | 0.130    |
| JCDSS          | 0.571**  | 0.470**  | 0.299    |
| BPRS positive symptom | -0.014   | -0.113   | 0.107    |
| BPRS negative symptom | 0.214    | 0.352*   | 0.157    |
| DIEPSS         | 0.222    | 0.064    | 0.301    |

Notes: *p < 0.05, **p < 0.01, Spearman rank correlation. (False Discovery Rate correction)

Abbreviations: JSQSL, Japanese version of the Schizophrenia Quality of Life Scale; JSQSL PS, Psychosocial scale of JSQSL; JSQSL ME, Motivation/Energy scale of JSQSL; JSQSL SS, Symptoms/Side effects scale of JSQSL; MMSE-J, Mini Mental State Examination-Japanese; JCDSS, Japanese version of the Calgary Depression Scale for Schizophrenia; BPRS, Brief Psychiatric Rating Scale; DIEPSS, Drug-induced Extrapyramidal Symptoms Scale.
responses to antipsychotic drugs, and side effects of antipsychotic drugs were considered as important predictors of QOL. However, Larsen, et al. (6) studied the relationship between psychiatric symptoms, medication side effects, and subjective QOL in chronic outpatients with schizophrenia visiting an outpatient clinic and reported that no significant correlation between subjective QOL and mental status, and side effects of drugs.

When summarizing the results of previous studies, we could say that depressive symptom is considered important as a clinical factor affecting the subjective QOL of outpatients with schizophrenia (40). In this study, we focused on inpatients with schizophrenia who had severer positive or negative symptom and higher level of drug-induced extrapyramidal symptom than outpatients. So, we expected that those symptoms would affect their subjective QOL significantly. Moreover, recently, cognitive dysfunction of patients with schizophrenia has been reported to be more important than psychiatric symptoms in terms of affecting daily functioning and interpersonal relationships (41-43). Therefore, we also expected that cognitive function would affect their subjective QOL. However, the results of this study clearly show that depressive symptom is only clinical factor independently affecting subjective QOL. This may be because subjects of this study had severer depression level than outpatients in the previous study (4). But the results suggest that improvement of depressive symptom may lead to better subjective QOL in the inpatient treatment of schizophrenia.

**CONCLUSION**

We found a clinical factor influencing subjective QOL of inpatients with schizophrenia. Although inpatients have severer psychiatric symptoms than outpatients, positive and negative symptoms do not affect their QOL significantly, but only depressive symptom significantly influences it. This is a new finding we found in this study, suggesting that focusing on treatment of...
depressive symptom may lead to better QOL of inpatients with schizophrenia.

**CONFLICT OF INTEREST**

The authors declare no conflict of interest.

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