Clinical Outcome of Patients With Schizophrenia Without Maintenance Treatment in a Nonindustrialized Society

by Toshiyuki Kurihara, Motoichiro Kato, Robert Reverger, and Gohei Yagi

Abstract

The outcome of 51 patients with schizophrenia (DSM-III-R) consecutively admitted to Bangli State Mental Hospital (Bali) with no prior psychiatric treatment was assessed by the Positive and Negative Syndrome Scale (PANSS) and Eguma's Social Adjustment Scale (ESAS) at a 5-year followup evaluation. The subjects were divided into two groups according to their medication patterns determined at the assessment. Mann-Whitney U test revealed no significant differences in the PANSS scores between the treated group (n = 22) and the nontreated group (n = 29), whereas a significant difference in the distribution of the scores was observed (Kolomorov-Smirnoff test, p < 0.05). Subjects in the nontreated group showed a greater tendency to be scored either high or low in the PANSS than did subjects in the treated group. Moreover, subjects in the nontreated group tended to be classified more often into the best or worst outcome categories when the ESAS was performed than subjects in the treated group (chi-square analysis, p < 0.05). In the present study, nontreatment may reflect a good outcome in terms of no requirement for continuing treatment but still be causally related to poor outcome in terms of absence of the necessary treatment. The results suggest the importance of therapeutic intervention for schizophrenia patients who have severe psychopathology without maintenance treatment in nonindustrialized societies.

Keywords: Schizophrenia, outcome assessment, maintenance treatment, duration of untreated psychosis (DUP), developing countries.


Although the efficacy of neuroleptic drugs for reducing symptoms and preventing relapse in schizophrenia is clearly established and widely accepted, there is growing concern over the limitations and drawbacks of these agents, such as tardive dyskinesia (Carpenter et al. 1990). Many studies have investigated the effect on schizophrenia patients of reducing antipsychotic medication in an attempt to minimize the side effects of neuroleptics while avoiding a worsening of clinical condition (Carpenter et al. 1990; Jolley et al. 1990; Herz et al. 1991). Schooler et al. (1995) reviewed these studies and concluded that although both continuous low-dose and intermittent treatment are feasible, intermittent strategy incurs higher relapse and rehospitalization rates. Carpenter (1997) stated in his report on the risk of medication-free research that single-episode patients create a dilemma in that long-term drug continuation exposes a minority of patients to more risks than benefits, while discontinuing medication will expose the majority of patients to an increase in exacerbation.

The above-mentioned studies reported on schizophrenia patients who discontinued maintenance medication for research purposes. In contrast, to the best of our knowledge, only one study has investigated the outcome of patients with schizophrenia in a clinical setting who ceased taking maintenance medication for their own reasons. The sole research, done by Fenton and McGlashan (1987), describes schizophrenia patients who continued to show a good outcome without maintenance medication for an average of 15 years. Schizophrenia patients whose clinical condition is in remission are presumed to have a tendency to discontinue taking maintenance treatment (Valliant 1963; Edgerton and Cohen 1994). However, another factor may concern schizophrenia patients who discontinue medication while living in a developing nation. Lin and Kleinman (1988) hypothesized that patients with a poor outcome in developing countries were less likely than those in developed countries to seek help from psychiatric institutions, and as a result many dysfunctional
patients were living without maintenance treatment in remote villages. The International Pilot Study on Schizophrenia (WHO 1973; Leff et al. 1992) and the subsequent Determinants of Outcomes of Severe Mental Disorder (DOSMD) (Jablensky et al. 1992) by the World Health Organization (WHO) concluded that the course and outcome of schizophrenia was more favorable in developing than in developed countries. However, Lin and Kleinman (1988) claimed that because of the high attrition rate in the WHO studies, the evidence for a more favorable course in developing societies was inconclusive because researchers in nonindustrialized societies could reach a disproportionate number of the positive treatment outcome patients, while dysfunctional patients in remote villages were less likely to be followed up.

Our hypothesis was that schizophrenia patients who dropped out from psychiatric services in nonindustrialized societies would show a favorable outcome, as predicted by Vaillant and Edgerton and Cohen. In the present study, we performed a home visit assessment to determine the clinical condition and social adaptive states of schizophrenia patients who did not maintain contact with mental health facilities in Bali to test the hypothesis.

Method

Study Area. Bali is located in Southeast Asia and is one of more than 10,000 islands that make up Indonesia. It is famous as a tourist resort and for its unique Hindu culture. There are approximately 2.7 million people living in Bali, and the island is almost entirely ethnically and culturally homogeneous. Industry in the country is now in the developing stages. Bali has 270 psychiatric beds, of which 225 are at the Bangli State Mental Hospital, the primary mental health facility on the island. The bed occupancy rate for the hospital in 1994–1995 was 65.1 percent. There is a much smaller number of psychiatric beds per 10,000 people in Bali (approximately 1.0 in 1998) than in Japan (28.5 in 1998 [Health Service Bureau 1999]), a developed country also located in Asia.

Subjects and Criteria. The subjects were 59 patients who had been consecutively hospitalized at the Bangli State Mental Hospital, with no prior psychiatric treatment, between January 1990 and April 1991 and whose diagnosis met the PPDGJ–II criteria (Pedoman Penggolongan dan Diagnosis Gangguan Jiwa di Indonesia Edisi II; Ministry of Health, Republic Indonesia 1983) for schizophrenia. The present study included subjects whose initial diagnosis was either schizophreniform disorder or brief reactive psychosis that converted into schizophrenia during the following medical examination. No subjects had comorbidity of either organic mental disorders or psychomotoractive substance abuse disorders. PPDGJ–II, the Indonesian criteria for mental disorders, is based on DSM–III (American Psychiatric Association 1980) and ICD–9 (WHO 1978). The PPDGJ–II screening criteria for schizophrenia are identical to those of DSM–III, and thus the minimum requirement for symptom duration is 6 months. At the followup assessment, the senior author (T.K.) rediagnosed the subjects based on DSM–III–R (American Psychiatric Association 1987) using the Structured Clinical Interview for DSM–III–R (Spitzer et al. 1990). All of the subjects’ rediagnoses were based not only on their clinical interview but also on information from family members. Main informants were fathers, mothers, or both in 28 cases, spouses in 14 cases, siblings in 8 cases, and a son in 1 case. Moreover, we investigated the subjects’ sociodemographic and clinical data (age, sex, age at onset, length of first admission, duration of untreated psychosis [DUP], number of family members, marital status, educational period, time required to go to the hospital) based on either medical records or interviews with subjects and their family members. Onset was defined as the time when the patient’s symptoms began to meet DSM–III–R criteria based on clinical interview with the patients and their family members.

Outcome Measures. The clinical symptoms were evaluated using the PANSS (Kay et al. 1987, 1988), which is a valid scale used in many non-English-speaking countries (Kay et al. 1990; von Knorring and Lindstrom 1992; Kawasaki et al. 1994). The validity and reliability of the Indonesian version has also been established (Salan et al. 1994). We used the ESAS (Eguma 1962; Ogawa et al. 1987; and see appendix) for the assessment of social adjustment. A home visit assessment was performed for all subjects and their families. The interview was conducted by the first author, who was unaware of the medication patterns of the subjects. All subjects’ evaluations were based not only on their clinical interview but also on information from family members. Main informants were the same as stated in the Subjects and Criteria section. In addition, we investigated the relationship between subjects’ sociodemographic data (age, sex, age of onset, length of first admission, DUP, number of family members, marital status, educational period, time required to go to the hospital) and either the PANSS scores (positive, negative, general psychopathology, total score) or the ESAS classifications.

Rating and Diagnostic Reliability. The interrater reliability of the PANSS was independently tested on 16 schizophrenia patients at the Bangli State Mental Hospital by the Japanese senior author, who can speak Indonesian, and the third author (R.R., Indonesian rater) to confirm
the reliability of the clinical interview carried out by the first author. The positive scale gave a reliability of 0.813, the negative subscale 0.844, and the general psychopathology subscale 0.832 according to analysis of variance (ANOVA) intraclass correlation coefficient (ICC, Bartko 1966), indicating that the evaluation of the psychotic symptoms in Indonesia by the Japanese senior author was reliable. In addition, the interrater reliability of the ESAS was tested on 30 schizophrenia outpatients in Bali independently by the Japanese senior author and two Indonesian psychiatrists. The ICC (Fleiss 1965) was 0.82, indicating sufficient reliability in the evaluation of subjects’ social adjustment by the senior author. Moreover, to establish the diagnostic reliability between the senior author and the Indonesian psychiatrists using subjects not included in the present study, 53 consecutively admitted patients at the Bangli State Mental Hospital in 1995 were diagnosed independently by the senior author based on DSM-III and two Indonesian psychiatrists based on PPDDJ-II. This comparison demonstrated a satisfactory level of concordance for the diagnosis of schizophrenia ($\kappa = 0.78$), revealing that the groups were using equivalent criteria and confirming the reliability of the diagnosis by the first author.

**Division into Two Groups.** Information concerning the type of medication the subjects had been taking was based on medical records and reports given by family members at the last part of the clinical interview. Once this information was obtained, we divided the subjects into two groups: a treated group, composed of patients who were on medication at the assessment or had been on medication occasionally over the 4.5-year period prior to the assessment; and a nontreated group, composed of patients who had not been on medication at any point during the 4.5-year period prior to the assessment. Subjects’ medication in the first 6 months of the followup period was not considered when assigning patients to groups; thus subjects who had been on medication for only a short while immediately after discharge were not included in the treated group, but rather were assigned to the nontreated group. Of the 51 patients, 22 and 29 were assigned to the treated group and the nontreated group, respectively. The treated group ($n = 22$) consisted of 13 individuals who were on medication at the followup assessment and 9 who had been on medication occasionally whenever a relapse or worsening of the symptoms occurred during the 4.5-year period prior to the assessment. The nontreated group ($n = 29$) consisted of 25 individuals who did not take psychotropic medication after discharge and 4 who had maintained contact with the outpatient clinic during only the 6 months after discharge, a period that we did not consider when dividing subjects into groups. Of the four subjects, two came to the outpatient clinic only once, and two did so only three times, which virtually means that they did not undergo maintenance treatment and thus should properly be classified into the nontreated group rather than the treated group. We investigated the difference in sociodemographic and clinical data and outcome assessments between groups.

**Statistical Analysis.** A chi-square analysis (with a Yates correction) was used to assess differences in gender, marital status, and distribution of classification on the ESAS between groups. A 2-tailed $t$ test was used to assess differences in the remaining sociodemographic and clinical data (age, age at onset, length of first admission, DUP, number of family members, educational period, time required to go to the hospital) between groups. The Kolomogorov-Smirnov test was used to analyze the distribution of the total PANSS scores between groups, and the Mann-Whitney $U$ test was used to assess differences in both the individual subscale scores and the total scores of the PANSS between groups.

A chi-square analysis was performed to evaluate the relationship between sociodemographic data (sex, marital status) and ESAS. A 2-tailed $t$ test was used to assess the relationship between these sociodemographic data and the PANSS scores. Correlations between sociodemographic and clinical data (age, age at onset, DUP, number of family members, educational period, time required to go to the hospital) and the PANSS scores were assessed using Pearson’s correlation coefficient. Moreover, one-way ANOVA was conducted to assess the relationship between these sociodemographic and clinical data and the ESAS classifications.

**Results**

Of the 59 Balinese subjects, 51 (86.4%) could be assessed by the PANSS and ESAS. The remaining 8 subjects dropped out because of death in 7 cases and refusal to participate in the interview in 1 case. Of the 7 deaths, 6 were the result of a physical disease, and 1 was an accident. All of the 51 followup subjects were rediagnosed as having schizophrenia. In particular, 38 (74.5%) met the criteria for schizophrenia (DSM-III-R) at the followup assessment, while the remaining 13 (25.5%) were in remission but were diagnosed as having schizophrenia with a lifetime prevalence. The finding is supported by other studies demonstrating strong diagnostic stability of schizophrenia (Tsang et al. 1981; Vetter and Köller 1993). No patients were in the hospital at the time of the followup assessment.

Of the 51 subjects, 31 were males and 20 were females. At the first entry, subjects had a mean age of 27.0
years (standard deviation [SD] 7.95), mean educational period of 6.3 years (SD 3.62), mean age at onset of 24.6 years (SD 7.12), mean length of first hospitalization of 39.5 days (SD 36.7), mean DUP of 28.2 months (SD 50.64), mean number of family members of 4.7 (SD 2.09), and mean time required to go from home to the hospital of 156.8 minutes (SD 78.7). A total of 51.0 percent of the subjects were married. During the month prior to the first medical examination, 22 patients (43.1%) showed violent behavior toward other persons, property, or both, and 5 (9.8%) attempted suicide. All of the subjects showed at least one of the psychotic symptoms in the active phase of schizophrenia described in DSM-III-R. No subjects visited the hospital voluntarily; instead, all subjects were brought to the hospital by other family members. In addition, all subjects were seen by at least one traditional healer prior to the first medical examination. At the 5-year followup, 7 (13.7%) still showed violent behavior as a presenting problem during the month prior to the examination, whereas no subjects had attempted suicide. The mean positive, negative, general psychopathology, and total scores on the PANSS at followup were 17.63 (SD 8.78), 21.80 (SD 10.91), 37.57 (SD 14.66), and 77.00 (SD 33.07), respectively. Seventeen subjects (33.3%) were classified on the ESAS as “self-supportive,” 10 (19.6%) as “semi-self-supportive,” 14 (27.5%) as “socially adjusted to family or community,” and 10 (19.6%) as “maladjusted”; none were classified as “hospitalized.”

No significant relationship was observed between subjects’ sex (male or female) or marital status (single or married) and ESAS classifications. In addition, we found no significant difference in the PANSS scores between either gender or marital status. There was no significant correlation between other sociodemographic and clinical data and the PANSS scores. In addition, one-way ANOVA revealed no significant difference in these sociodemographic and clinical data among the ESAS classifications.

We compared the treated group (n = 22) and the nontreated group (n = 29) in terms of psychotic symptoms, social adaptability, and sociodemographic and clinical data (table 1). In terms of the sociodemographic and clinical data, the mean time required to go from home to the hospital was longer (p < 0.05) and the mean DUP was shorter (p < 0.05) in the nontreated group than in the treated group. Mann-Whitney U test revealed no significant differences in any of the individual subscale scores or the total score of the PANSS between the groups (table 2). However, the distribution of the total PANSS scores was

Table 1. Sociodemographic and clinical data for the two groups

<table>
<thead>
<tr>
<th></th>
<th>Treated group (n = 22)</th>
<th>Nontreated group (n = 29)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age (yrs), mean (SD)</td>
<td>27.3 (7.86)</td>
<td>26.8 (8.15)</td>
</tr>
<tr>
<td>Sex (male/female)</td>
<td>11/11</td>
<td>20/9</td>
</tr>
<tr>
<td>Age at onset (yrs), mean (SD)</td>
<td>23.5 (5.99)</td>
<td>25.6 (7.85)</td>
</tr>
<tr>
<td>Length of first admission (days), mean (SD)</td>
<td>36.3 (30.3)</td>
<td>42.0 (41.2)</td>
</tr>
<tr>
<td>Duration of untreated psychosis, mean (SD)</td>
<td>44.2 (68.6)*</td>
<td>16.2 (26.4)</td>
</tr>
<tr>
<td>Number of family members, mean (SD)</td>
<td>4.55 (1.77)</td>
<td>4.79 (2.34)</td>
</tr>
<tr>
<td>Marital status (married/single)</td>
<td>11/11</td>
<td>15/14</td>
</tr>
<tr>
<td>Education (yrs), mean (SD)</td>
<td>6.55 (3.56)</td>
<td>6.17 (3.72)</td>
</tr>
<tr>
<td>Time required to go to hospital (min), mean (SD)</td>
<td>128.9 (57.5)*</td>
<td>178.0 (86.6)</td>
</tr>
</tbody>
</table>

Note.—SD = standard deviation. Chi-square test was performed for gender and marital status. Two-tailed t tests were conducted for all other items.
* p < 0.05

Table 2. PANSS scores for the two groups

<table>
<thead>
<tr>
<th></th>
<th>Treated group (n = 22)</th>
<th>Nontreated group (n = 29)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Positive, mean (SD)</td>
<td>19.05 (7.60)</td>
<td>16.55 (9.57)</td>
</tr>
<tr>
<td>Negative, mean (SD)</td>
<td>23.36 (9.51)</td>
<td>20.62 (11.89)</td>
</tr>
<tr>
<td>General psychopathology, mean (SD)</td>
<td>38.96 (12.09)</td>
<td>36.52 (16.48)</td>
</tr>
<tr>
<td>Total score, mean (SD)</td>
<td>81.36 (27.63)</td>
<td>73.69 (36.80)</td>
</tr>
</tbody>
</table>

Note.—PANSS = Positive and Negative Syndrome Scale. Mann-Whitney U test was conducted. No significant differences were found.
proven to be significantly different by the Kolomogorov-Smirnoff test \( p < 0.05 \). We showed the difference in distribution (figure 1) by dividing subjects into excellent (subjects with a score in the bottom 25th percentile), good (subjects with a score in the 25th to 50th percentile), moderate (subjects with a score in the 50th to 75th percentile), and poor (subjects with a score in the top 25th percentile) outcome categories according to the PANSS assessment. Nontreated subjects showed a greater tendency to be classified into excellent (total score less than 48) or poor (total score more than 100) outcome categories. Moreover, also in the ESAS assessment, a significant difference in the distribution of classification between groups was observed \( p < 0.05 \). Patients in the nontreated group showed a greater tendency to be classified as either "self-supportive (A)" or "maladjusted (D)" in the ESAS assessment, whereas subjects in the treated group tended to be classified into "socially adjusted to family or community (C)" (figure 2).

The results suggest that patients in the nontreated group showed a greater tendency to be classified into either the best or worst outcome categories in the PANSS and ESAS assessments than subjects in the treated group.

**Discussion**

In the present study, the Mann-Whitney \( U \) test did not detect any significant differences in any of the individual subscale scores or the total scores of the PANSS between the treated group and the nontreated group. Hence, the result basically failed to support our original hypothesis that the outcome of schizophrenia patients without maintenance treatment would be favorable in a nonindustrialized society. However, the outcome of drug-free patients with schizophrenia showed a greater tendency to be classified into either best or worst outcome categories, revealing that schizophrenia patients with good outcome (less than 48 for the PANSS total score, "self-supportive" in ESAS, or both) exist without maintenance treatment in nonindustrialized societies as we hypothesized, and that those with poor outcome (more than 100 in the PANSS total score, "maladjusted" in the ESAS, or both) can also be found, as Lin and Kleinman hypothesized. In the present study, non-treatment may be good for the subgroup of patients who do not need treatment and bad for the subgroup of patients who do need treatment. In contrast, most subjects in the...
Figure 2. Distribution of the ESAS classification between groups

Treated group may need to undergo maintenance treatment to begin with because of some psychiatric symptoms, and thus the number of subjects in the best outcome categories would be smaller. Moreover, their clinical condition may improve in response to treatment, and thus the number of subjects in the worst outcome categories would be smaller than that in the nontreated group.

One of the factors related to the relatively high number of patients with good outcome in the nontreated group observed in the present study might be the motivation for seeking psychiatric help in developing countries. In the present study, 22 patients (43.1%) showed violent behavior toward other persons, property, or both during the month prior to the first medical examination. Volavka et al. (1997) reassessed the DOSMD data and came to the conclusion that a history of violent behavior was more frequently encountered in developing (31.5%) than in developed countries (10.5%). One of their hypotheses that may account for this finding is that less dramatic indicators of an individual's distress are responded to earlier in developed countries by laypeople and professionals alike, whereas in developing countries, motivation for seeking help may ultimately be violent behavior due to florid positive symptoms. Thus, patients who have only mild symptoms or are in remission may tend to withdraw from psychiatric facilities in developing countries. Another possible explanation for the relatively high number of patients with good outcome in the nontreated group observed in the present study is that the lack of treatment itself might lead to a better outcome for some patients. Judd et al. (1973) examined good premorbid schizophrenia patients by dividing them on the basis of paranoid-nonparanoid status and reported that nonparanoid patients showed favorable outcome on the placebo. Nonparanoid placebo subjects were less responsive in skin resistance reactivity when exposed to a variety of standardized social and nonsocial stimuli than were nonparanoid drug subjects, whereas medication reduced response for paranoid subjects. In the present study, however, no information was available on the patients' premorbid function or paranoid-nonparanoid dichotomy, and thus further investigation is needed to confirm this possibility. Nontreatment for Balinese patients with good outcome may have considerable benefits, as there are no "chronic institutionalized" patients, as there are in Japan. Such patients remain in a psychiatric hospital even though their psychiatric condi-
tion is no longer serious (Ogawa et al. 1987). Patients not on medication also do not run the risk of serious side effects of psychotropic drugs, such as tardive dyskinesia.

However, in the nontreated group in the present study, schizophrenia patients with severe psychopathology were observed in contrast to patients in remission who did not need medication. This finding demonstrates the importance of therapeutic intervention for such patients in non-industrialized societies. The determinants of why a given patient kept in contact with a mental health facility or did not may include such factors as the patient's and his or her family's cultural belief system and socioeconomic condition, in addition to the severity of psychotic symptoms. In Bali, one example of the effect of a cultural belief system is the reference to supernatural forces to explain the cause of mental disorders. According to Jensen and Suryani (1992), if a family member has a mental disorder, the Balinese generally go first to traditional healers, because most Balinese believe in the black magic theory of illness causation. The finding in the present study that all subjects were seen by at least one traditional healer prior to their first examination supports the above explanation. However, one's belief in illness attribution needs to be carefully considered. In Nepal, where shamans are indispensable in a family's attempts to cope with illness and misfortune, as in Bali, Pigg (1996) stated that skepticism toward shamans has recently become common. Some Nepalese do not put their faith in ritual practitioners but understand that they live among people who continue to find solace in traditional healing, whereas other Nepalese simply recognize the need for ritual practitioners because their world is a village that is deeply involved with shamanic power. No one tries to eliminate the ritual practitioners; instead, they find a way to be “modern believers” and thereby remain connected to the village (Pigg 1996). Similar changes, namely skepticism toward traditional healing, might have occurred in the Balinese belief system. Thus, future research must attempt to explore this belief system in detail from a medical anthropological point of view and to describe the extent to which it may affect whether schizophrenia patients maintain contact with a psychiatric facility in Bali. In terms of socioeconomic factors and their effect on discontinuation of maintenance treatment, the time required to go from home to the hospital was significantly longer for subjects in the nontreated group than in the treated group. With the present situation in Bali, where there are only three hospitals with psychiatric beds and the transportation system is in the developing stages, it is hard for a patient who lives in a remote area to maintain contact with the mental hospital over a long period of time. In the present study, however, the time required to go from home to the hospital was not associated with either the scores on the PANSS assessments or classification on the ESAS, indicating that it was not a reliable predictor of clinical outcome but determined only whether the subjects continued taking medication. Moreover, medical expenses for examination impose a rather heavy burden on Balinese patients' families.

A number of studies have shown that a longer DUP is associated with slower recovery and poorer outcome of schizophrenia, and thus that early treatment intervention is important (Helgason 1990; Wyatt 1991; Loebel et al. 1992; McGlashan and Johannessen 1996). According to McGlashan's review (1999), the mean DUP across studies in Western countries lies between 1 and 2 years, and the median DUP is about 6 months, both of which are alarmingly long. In Bali, the mean DUP was 28.2 months, the median DUP was 12.0 months, and the range of DUP was from 1 day to 25 years. The median DUP, which may be the best indicator for measuring DUP given its very large SD (McGlashan 1999), is about twice as high in Bali as it is in Western industrialized societies. McGlashan (1999) reported that DUP appears to be the product of many factors, such as denial of illness by the patient and family, withdrawal and isolation from friends and relatives, paranoid views of the mental health treatment systems, as well as loss of motivation, direction, or will to make the effort to ensure treatment contact. In Bali, in addition to these factors, the financial burden of the medical examination, inconvenient access to the mental hospital, and the reference to supernatural forces to explain the cause of mental disorders may also be associated factors, and thus DUP may be much longer in Bali than in Western countries. However, DUP was not associated with clinical outcome shown by the subjects' PANSS and ESAS assessment scores in the present study. In addition, we observed a difference in DUP between the treated group and the nontreated group, and there was no clear quantitative difference in clinical outcome measures between the two groups. These findings are consistent with those of recent studies (Johnstone et al. 1999; Craig et al. 2000) in which DUP has not been associated with the outcome of functional psychosis. In the present study, however, we failed to examine the relationship of DUP with other indexes of prognosis, such as type of illness onset (acute vs. insidious) and premorbid functioning. Unfortunately, although we recognize that this procedure is important in DUP studies, as noted by McGlashan (1999), we do not have any information on either of these two indexes. Fenton and McGlashan (1991) reported that schizophrenia with many negative symptoms was associated with insidious onset, poor premorbid functioning, partial or no remissions during the first several years of illness, and in most cases a progressive course leading to permanent disability. Thus, future studies should investigate the relationship between DUP and outcome after controlling for these
other indexes of prognosis in Bali. Moreover, onset in the present study was defined as the time at which the patient’s symptoms began to meet the DSM-III-R criteria based on the clinical interview with the patients and their family members. Hence, a more rigid definition and determination of onset is needed to obtain more accurate data on DUP.

One of the most important factors in relation to both discontinuation of maintenance treatment and the longer DUP may be the Balinese attribution model of mental disorders that leads schizophrenia patients to go to traditional healers. However, psychiatrists and traditional healers are not mutually exclusive in Bali. Traditional healers themselves sometimes refer patients to psychiatrists; we did not determine the frequency of such behavior in the present study. Salan and Maretzki (1983) pointed out that because of the extremely widespread utilization of healers’ services, there are opportunities for early detection of acute and potentially serious psychiatric problems in Indonesia. From this point of view, it would be important for Balinese psychiatrists not to conflict with healers but to integrate them into clinical practice.

The present study has several limitations. First, using small groups without random assignment makes the results rather difficult to interpret. Second, none of the subjects’ clinical course for the disorder had been prospectively observed for 5 years because of the difficulty in longitudinally following up dropout subjects living in remote villages. Third, the ESAS assessment is the sort of global social-clinical assessment that can flatten discrepancies in different areas of functioning and thus may give an oversimplified picture of the outcome of schizophrenia, as Strauss and Carpenter (1972) pointed out. Although the ESAS focuses mainly on a patient’s social adjustment, items regarding hospitalization are also associated with the patient’s clinical condition, difficulties in accessing the hospital, and the family’s acceptance of the patient. To what extent these factors affect the global rating of ESAS is difficult to evaluate. Fourth, we may have missed examining schizophrenia patients whose diagnosis converted from other forms of mental disorder after they had withdrawn from medical examination. Future studies must overcome these limitations and more explicitly investigate how and to what extent factors such as patients’ and their families’ cultural beliefs, financial burden, and patients’ clinical condition affect the decision on whether or not to undergo maintenance treatment. Moreover, we need to examine what kind of advantage or disadvantage is conferred on patients and their families by both continuation and discontinuation of maintenance treatment in order to develop an optimal therapeutic strategy for individuals with schizophrenia in developing countries.

Appendix

Eguma’s Social Adjustment Scale (ESAS)

(A) Self-supportive
1. Has returned to a level of social functioning similar to that prior to onset of illness
2. Maintains an independent social life with or without asking any advice from psychiatrists or acquaintances
3. Maintains a normal family life (housewife, for example)

(B) Semi-self-supportive
1. Displays vocational ability, with some occasional failures
2. Maintains a positive attitude toward work, but needs supervision and guidance
3. Maintains a normal life at home, but hesitates to return to the job held prior to onset of illness

(C) Socially adjusted to family or community
1. Works when encouraged, with continuous significant support from others
2. Needs more time before being ready to return to previously held job
3. Able to work continuously if the work is kept at a simple level

(D) Maladjusted
Social adjustment not possible
1. Nonproductive life (able to be cared for at home)
2. Anti-social (admission to psychiatric hospital necessary)

(E) Hospitalized
In psychiatric hospital

References

Craig, T.J.; Bromet, E.J.; Fennig, S.; Tanenberg-Karant, M.; Lavelle, J.; and Galambos, N. Is there an association


**Acknowledgments**

The authors wish to thank Aihide Yoshino, M.D., for his assistance with this study.

**The Authors**

Toshiyuki Kurihara, M.D., is Psychiatrist, Komagino Hospital, Tokyo, Japan. Motoichiro Kato, M.D., is Associate Professor, Department of Neuropsychiatry, School of Medicine, Keio University, Tokyo, Japan. Robert Reverger, M.D., is Head of the Psychiatry Unit, Wangaya General Hospital, Bali, Indonesia. Gohei Yagi, M.D., is Associate Professor, Department of Neuropsychiatry, School of Medicine, Keio University, Tokyo, Japan.