Preliminary communication

Affective temperaments and psychotropic adherence

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ABSTRACT

Background: It is generally accepted that a range of factors affect adherence to psychotropic medications. In the present study, we focused on the influence of affective temperaments (i.e., depressive, hyperthymic, cyclothymic, irritable, and anxious temperaments) on treatment adherence.

Methods: Thirty-eight psychiatric consecutive inpatients were instructed to perform Temperament Evaluation of Memphis, Pisa, Paris, and San Diego-Autoquestionnaire version (TEMPS-A) for affective temperaments, Drug attitude inventory-10 (DAI-10) for concordance and persistence, and Visual Analogue Scale (VAS) for compliance.

Results: VAS scores for dose compliance were significantly and negatively associated with irritable temperament scores whereas DAI-10 scores were significantly and positively associated with male gender, depressive temperament scores and hyperthymic temperament scores.

Limitations: The main limitations of the study were the relatively small number of subjects and the lack of objective method of adherence.

Conclusions: These findings suggest that patients with irritable temperament may be poor in their compliance with treatment, and that more education may be required for patients with irritable temperament in order to maintain good compliance. In contrast, men and patients with depressive or hyperthymic temperament have a relatively positive attitude towards medication.

1. Introduction

The term "adherence" is now preferred over the earlier term "compliance" because it recognizes patient choice as opposed to passive obedience to physician (Cortet and Bénichou, 2006). There are several strategies to measure adherence including questionnaires, pill counts, medication possession ratio (MPR), electronic dispensing devices, and serum drug levels. Poor adherence puts obstacles in psychiatric treatment. In particular, patients with mood disorders or schizophrenia often shift to poor adherence and thereby easily relapse and quit jobs and/or readmitted to psychiatric hospital (Rittmannsberger et al., 2004; Lindenmayer et al., 2009; Novick et al., 2010; Ascher-Svanum et al., 2009).

With regard to schizophrenic patients, it has been reported that 71% of 6731 patients showed good adherence (Novick et al., 2010) whereas, in another study, 41% of 2801 patients had good adherence (Gilmer et al., 2004). As for bipolar patients, it has been reported that 61% of 5491 patients who were equal to or more than 60 years were demonstrated good adherence while 49.5% of 21494 patients less than 60 years similarly showed good adherence (Sajatovic et al., 2007a). These findings suggest that not a few patients may have poor adherence.

As such, several studies have investigated enhancing factors and inhibiting factors of adherence. In the case of schizophrenia, male patients (Becker et al., 2007; Ahn et al., 2008), white patients (Ascher-Svanum et al., 2006a; Becker et al., 2007; Ahn et al., 2008), and the use of atypical antipsychotic drugs (Valenstein et al., 2004; Gianfrancesco et al., 2006; Becker et al., 2007) have been identified as enhancing factors of adherence. On the other hand, black and/or minority patients (Valenstein et al., 2004; Perkins et al., 2008; Ahn et al., 2008), young patients (Valenstein et al., 2004; Novick et al., 2010), comorbid substance abuse (Olfson et al., 2000; Ascher-Svanum et al., 2006a, 2006b; Perkins et al., 2008; Novick et al., 2010) and poor cognitive function (Robinson et al., 2002; Perkins et al., 2008) have been identified as inhibiting factors of adherence for schizophrenic patients. Whereas in bipolar disorder, black and/or minority patients (Sajatovic et al., 2006, 2007a; Zeber et al., 2008), young patients (Sajatovic et al., 2006; Sajatovic et al., 2007b; Baldessarini et al., 2008), homeless patients (Sajatovic et al., 2006, 2007a, 2007b), comorbid substance abuse (Sajatovic et al., 2006, 2007a, 2007b), and frequent relapses of mood episodes (Baldessarini et al., 2008; Martinez-Aran et al., 2009) have been identified as inhibiting factors for adherence.

Personality has also been identified as a factor associated with adherence. For example, Arnau et al. (2008) investigated 89 alcoholic patients during a 100-day outpatient treatment phase following their release from a hospital detoxification unit. Of the group studied, 34.8% abandoned the treatment and 31.5% relapsed. From measurements of temperament derived from the Temperament and

Character Inventory (TCI), patients who abandoned treatment demonstrated lower scores on cooperativeness scale whereas higher scores of persistence, self-directedness and cooperativeness predicted a better adherence. Subsequently, Aukst-Margetić et al. (2011) explored the association between temperament and character in relation to medication adherence in 76 patients with schizophrenia by using the TCI, and showed that adherence significantly differed based on novelty seeking. Also, Liraud and Verdoux (2001) examined the links between temperamental characteristics and medication adherence in subjects with psychotic or mood disorders by using Sensation-Seeking Scale (SSS) and revealed that higher general SSS scores, as well as disinhibition and boredom susceptibility SSS subscores were associated with a greater risk to present with poor medication adherence.

Over a century ago Kraepelin proposed four distinct temperamental types (depressive, hyperthymic, cyclothymic and irritable) as Grundzutaende and conceptualized these temperaments as subclinical manifestations of major affective states, Akiskal (Akiskal and Mallya, 1987; Akiskal, 1995, 2007; Akiskal and Pinto, 1999) formulated the modern concept of affective temperaments in which there is a continuum between certain types of affective disorders and particular affective temperaments. He described the classic four temperaments and included anxious temperament with the development of Temperament Evaluation of Memphis, Pisa, Paris, and San Diego-Autoquestionnaire version (TEMPS-A). Following from our studies examining bipolar disorder and temperament (Goto et al., 2011; Hoaki et al., 2011; Tsutsumi et al., 2011; Wang et al., 2011; Araki et al., 2012; Kohno et al., 2012), we investigated the effects of temperament on psychotropic adherence by using TEMPS-A. To our knowledge, this is the first report measuring adherence in relation to TEMPS-A.

2. Methods

2.1. Subjects

Thirty-eight (23 men and 15 women, 52.2 ± 15.8 years) inpatients participated in this study. They were consecutively admitted to the psychiatric ward of our university hospital from February 2012 to August 2012. None of the sample had dementia. According to DSM-IV-TR, psychiatric diagnoses were schizophrenia ($N=10$), bipolar disorders ($N=9$), major depressive disorder ($N=16$), and others including dysthymic disorder ($N=3$). Each participant gave written informed consent to participate in this study according to procedures approved by the ethical committee at Oita University Faculty of Medicine.

2.2. Temperament identification

The Temperament Scale of Memphis, Pisa, Paris and San Diego-Autoquestionnaire (TEMPS-A) has been developed by Akiskal et al. (Akiskal and Mallya, 1987; Akiskal, 1995, 2007; Akiskal and Pinto, 1999). This scale has 110 questions to measure 5 temperaments (depressive, hyperthymic, cyclothymic, irritable and anxious) and has been verified in 32 language versions and has been widely used in a number of epidemiological and clinical studies with psychiatric patients and healthy subjects. Also in Japan, the scale has been validated and is widely used to identify affective temperaments (Matsumoto et al., 2005). The TEMPS-A was administered to the patients when their mental state became stable which was determined by the doctor in charge of the patient.

2.3. Adherence measurement

Visual Analogue Scales (VAS) were employed to measure subjective adherence by 3 questions including "Did you take medicine

regularly during the month just before admission to this hospital?" (total compliance), "Did you take medicine punctually during the month just before admission to this hospital?" (compliance with time), and "Did you take medicine in the same dose as instructed during the month just before admission to this hospital?" (compliance with dose). As for VAS scores, 0 mm was represented the worst state whereas 100 mm was for the best state. Moreover, Drug Attitude Inventry-10 (DAI-10) (Hogan et al., 1983; Nielsen et al., 2012) was used to measure patients' subjective assessment of the medication effect, side effects and usefulness. Scores range from −10 to +10, with higher scores indicating a more positive attitude towards medication. Both VAS and DAI-10 were also administered by the doctor in charge of the patient when their mental state became stable.

2.4. Statistical analyses

Firstly, the associations were analyzed between VAS scores (total compliance, compliance with time, and compliance with dose) and gender, age, disease (schizophrenia or not), and TEMPS-A scores of each temperament by Pearson's correlation or unpaired t-test. Similarly, the associations were analyzed between DAI-10 scores and gender, age, disease (schizophrenia or not), and TEMPS-A scores of each temperament by Pearson's correlation or unpaired t-test. Secondly, multiple regression analyses were performed using VAS sores or DAI-10 scores as dependent factors, and using several potential factors as independent factors. Finally, the associations between VAS scores and DAI-10 scores were analyzed.

3. Results

3.1. The association between VAS scores and other factors including TEMPS-A scores

The mean of VAS scores were 86 ± 24 (SD) mm for total compliance, 75 ± 34 mm for compliance with time, and 87 ± 27 mm for compliance with dose. There was no significant association of these VAS scores with gender or disease. However, VAS scores for compliance with time were significantly and positively associated with age ($r=0.36$, $p=0.027$). As shown in Table 1, VAS scores for total compliance were significantly and negatively associated with depressive temperament scores while VAS scores for compliance with dose were significantly and negatively associated with depressive temperament scores and irritable temperament scores, and significantly and positively associated with hyperthymic temperament scores.

Next, multiple regression analyses were performed using each of the VAS scores as independent factors and each of the temperament scores of TEMPS-A and age as independent factors. As shown in Table 2, VAS scores for compliance with dose were significantly and negatively associated with irritable temperament scores.

3.2. The association between DAI-10 scores and other factors including TEMPS-A scores

The mean of DAI-10 scores were 2.2 ± 4.5 (SD). There was no significant association of these VAS scores with age or disease. However, DAI-10 scores of men were significantly higher than those of women (3.8 ± 4.1 vs. -0.3 ± 4.0, $t=-3.1$, $p=0.0037$). As shown in Table 3, DAI-10 scores were significantly and positively associated with hyperthymic temperament scores.

Next, multiple regression analyses were performed using DAI-10 scores as independent factors and each temperament scores of TEMPS-A and gender (Men=1, Women=0) as independent factors. As shown in Table 4, DAI-10 scores were significantly and positively associated with gender (men), depressive temperament scores, and hyperthymic temperament scores.