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Tadashi Takeda · Nobumitsu Morimoto
Naoko Kinukawa · Ryuji Nagamine · Toshihide Shuto
Yukihide Iwamoto · Hisaaki Miyahara

Factors affecting emotional instability in female rheumatoid arthritis outpatients with limited functional disorder

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Abstract We attempted to identify which background factors were the most important indicators of such psychological problems as emotional instability, a feeling of hopelessness, and suicidal tendencies in female rheumatoid arthritis (RA) outpatients with limited functional disorder. Among female RA patients aged 20 years and older who visited the outpatient clinic, 101 class I and II patients were selected as subjects for the present study. An original questionnaire and a psychological test (CMI) were given to those subjects who had given their written consent to such testing, and an analysis was carried out on 85 patients who returned all the written forms. Their emotional instability was related to factors such as "not being able to understand the nature of RA disease and its treatment," "sense of value had changed after developing RA," "nonuse of drugs," and "duration of disease." A feeling of hopelessness was related to "smoking," and a suicidal tendency was related to "smoking" and "class I." We identified a characteristic correlation between emotional instability and background factors in this study. Paying close attention to these factors may thus be useful in preventing the appearance of psychological problems as well as in developing effective early treatment strategies.

Key words Rheumatoid arthritis · Emotional instability · Psychology · Sociodemographics · Background factors

T. Takeda (✉) · N. Morimoto
Department of Neuropsychiatry, Graduate School of Medical Science, Kyushu University, 3-1-1 Maidashi, Higashi-ku, Fukuoka 812-8582, Japan
Tel. +81-92-642-5628; Fax +81-92-642-5644
e-mail: ttakeda@npsych.med.kyushu-u.ac.jp

N. Kinukawa
Department of Medical Information Science, Kyushu University, Fukuoka, Japan

R. Nagamine · T. Shuto · Y. Iwamoto
Department of Orthopedics, Kyushu University, Fukuoka, Japan

H. Miyahara
National Kyushu Medical Center Hospital, Department of Orthopedics, Fukuoka, Japan

Introduction

Rheumatoid arthritis (RA) is a chronic progressive systemic disease with repeated remissions and aggravations. A fairly high incidence of psychological problems has long been reported in RA patients, accompanied by such physical symptoms as pain and joint deformation during the course of the illness.[1,2] Patients with RA are also prone to develop various types of stress from an early stage of onset, and aggravations due to psychological factors are commonly observed.[3,4] At the same time, it has been reported that psychological burdens also affect the onset of RA.[5]

By using the Cornell Medical Index Health Questionnaire (CMI),[6,7] emotional instability among RA patients has been confirmed.[8,9] It has been suggested that secondary causes of this instability may be frustration and other factors accompanying long-continued pain.[10] From this perspective, an analysis of emotional instability among RA patients is clinically important, and thus an investigation of the relationship between various factors that affect emotional instability is considered valid.

In order to achieve the above objective, we conducted a detailed statistical analysis on which background factors are most important in predicting emotional instability, including a feeling of hopelessness and suicidal tendencies, using the CMI and our original questionaire (Table 1), and thereafter targeted RA outpatients with limited functional disorders. This study was seen to be effective in accurately and quickly recognizing the state of patients with psychological problems, and also in preventing the development of some psychological problems.

Subjects and methods

Subjects

Female RA patients aged 20 years and older, who had visited the outpatient clinic dedicated to rheumatoid arthri-

Table 1. Original questionnaire. Department of Neuropsychiatry, Orthopedics, Kyushu University

1. Have you ever been hospitalized due to RA?
   1. Yes 2. No
2. Do you smoke now or have you ever smoked?
   1. Yes 2. No
3. What is your highest completed grade level at school?
4. Do you have a husband?
   1. Yes 2. No
5. Do you live with someone else?
   1. Yes 2. No
6. Are you employed? (have a job?)
   1. Yes 2. No
7. Do you have a reliable person who you can go to for advice?
   1. Yes 2. No
8. Has there been any decrease in the number of your friends after developing RA?
   1. Yes 2. No
9. Has there been any decrease in the frequency of going out socially after developing RA?
   1. Yes 2. No
10. Do you regularly and sufficiently consult the physician in charge of your RA treatment?
    1. Yes 2. No
11. Are you willing to join an RA study group?
    1. Yes 2. No
12. Are you trying any alternative medical treatments (such as acupuncture)?
    1. Yes 2. No
13. Do you understand RA (the nature of the disease) and its treatment?
    1. Yes 2. No
14. Have your sense of personal values changed after developing RA?
    1. Yes 2. No

tis at the Department of Orthopedics, Graduate School of Medical Science, Kyushu University from January to September 1998, and who met the revised criteria of the American Rheumatism Association for RA (ARA 1987) were assessed. From this group, 101 people who had been diagnosed to be class I or II according to the classification system defined by Steinbrocker et al.,[11] were selected as subjects for the present study. The subjects were informed of the study objectives beforehand by the rheumatologist (orthopedist) in charge. Original questionnaires and the CMI were given to those subjects who had given their written consent to such testing, and an analysis was carried out on 85 patients who completely filled out and returned the written forms. In this study, the subjects were all Japanese.

Methods

We investigated psychological problems such as emotional instability itself, a feeling of hopelessness, and a suicidal tendency using the CMI, the reliability and validity of which have previously been verified in Japan,[7] and we also used our own original questionnaire. The background factors considered to affect these psychological problems were put into three categories, i.e., physical, sociodemographic, and other, and we also analyzed how these problems were affected by each of the factors. The background factors were set up based on discussions between rheumatologists and liaison psychiatrists, while also taking into consideration other factors suspected of being clinically responsible for psychological distress, and referring to factors cited in the literature. After establishing the presence or absence of such psychological problems as dependent variables, with background factors as independent variables affecting the psychological problems, an analysis was carried out using statistical methods.

Dependent variables

Emotional instability

To investigate emotional instability, we used the CMI and assessed our findings based on the Fukamachi criteria,[7] which are widely used in Japan. The CMI includes significant comprehensive information about all the patients' medical problems. It consists of 18 sections (195 questions) referring to physical and psychological symptoms. The subjects were classified into four groups (areas I to IV) according to the distribution of total affirmative responses. The Fukamachi criteria defines area I as "diagnosed to be normal," area II as "provisionally diagnosed to be normal," area III as "provisionally diagnosed to be neurotic," area IV as "diagnosed to be neurotic." In the present study, we classified the patients who had emotional instability as either area III or IV, and the patients who did not have any emotional instability as either area I or II based on the CMI classification.

A feeling of hopelessness and suicidal tendencies

The Japanese version of CMI has been designed so that specific psychological problems, including feelings of hopelessness and suicidal tendencies, can be identified based on an affirmative answer to each single question.

The risk of suicide has been reported to be high among RA patients,[12] but to date there have been no reports analyzing suicidal tendencies in such patients in detail. In addition, hopelessness has also frequently been reported to show a significant correlation with suicide in other diseases.[13,14] We therefore consider it important to analyze these features in detail in order to try to prevent the serious psychological problem of "suicide."

These investigations established the presence or absence of a feeling of hopelessness, or of a suicidal tendency.

Independent variables

Background factors

After consideration of previous reports and discussions between rheumatologists and liaison psychiatrists, three factor groups were set up to cover the significant factors affecting the psychological problems mentioned above. These factor groups were determined based on clinical records and our

original questionnaire, and included: (1) physical factors, which were deemed to be related to the physical state; (2) sociodemographic factors, which were closely related to the patents' particular background, and contained factors deemed to be related to demographics, social interactions, and medical treatments; (3) other factors.

Physical factors. The items were designed to assess three factors.

1. Class grading (class I or II).
2. Stage grading (stage I, II, III, or IV).
3. Intensity of pain (a continuous variable).

The intensity of pain was assessed using the visual analog scale (VAS),[15] by which patients pointed out their intensity of pain over a 10-cm linear scale, as a continuous variable (minimum 0 mm, maximum 100 mm).

Sociodemographic factors. Seventeen items were classified into three groups: demographics, social interactions, and medical treatments. For demographics, the items were designed to determine eight factors.

1. Age at the time of the study (a continuous variable).
2. The disease duration (a continuous variable).
3. The presence of any history of hospitalization for RA.
4. The presence of any history of smoking.
5. A history of higher education (past the 12th grade).
6. The presence of a spouse.
7. Whether the subject lived alone or with someone else.
8. Whether or not the subject was employed (had a job).

For social interactions, the items were designed to investigate five factors.

9. Whether or not a consulting person was available.
10. Any decrease in the number of friends after developing RA or not.
11. Any decrease in the frequency of going out socially after developing RA or not.
12. Whether or not the patient had sufficiently consulted the physician in charge.
13. Whether or not the patient was willing to join an RA study group.

For medical treatments, the items were designed to determine four factors.

14. The presence of steroid treatment.
15. The presence of medication for the treatment of RA (including steroids).
16. Any alternative medical treatment (such as acupuncture) or not.
17. C-reactive protein (CRP) (a continuous variable).

The disease duration (item 2) is defined as the length of time from definite diagnosis to joining the study. In item 5, "higher education" applies to patients whose education lasted longer than 12 years, i.e., 9 years of obligatory education plus 3 years of high school education. (In Japan, over 90% of students graduate from high school.)

Other factors. The items were designed to determine two factors.

1. Whether or not the patient understood the nature of RA disease and its treatment.
2. Whether or not the patient's sense of value had changed after developing RA.

These two questions were included to investigate the patient's self-awareness of the understanding of the disease and any change in her sense of values. Illness representations have been reported to differ as a function of personal experience,[16] and we also previously reported that a patient's understanding of the nature of their disease and its treatment strongly affected their emotions regarding other chronic diseases.[17,18] Thus, these questions were considered to be important.

Procedures

At the time of consultation at the outpatient clinic, a physician explained the purpose of the investigation, and showed the written documents. Those patients who gave their informed consent were examined by a psychiatrist using CMI after the clinical examination. At the same time, an explanation was given regarding our original questionnaire which was prepared for the present study, and thereafter various forms were given to the patients to complete at home and later return by mail.

Statistical analysis

A stepwise multiple logistic regression analysis was used to evaluate the correlation of the respective psychological problems (dependent variables) with background factors (independent variables). The BMDP program LR (the statistical package) was used for the stepwise multiple logistic regression analyses, which were performed to evaluate the relationship between each psychological problem and the background factors (physical, sociodemographic, and other). Using this method, the most significantly associated variables were entered into the model. After adjusting for variables, the most significant variable was also added to the model. This procedure continued until there were no more variables which met the entry criterion ($P < 0.05$). All statistical analyses were performed using the BMDP Statistical Software package on a SPARC Station 20. We were able to utilize many independent variables using this analysis.

Results

Age, disease duration, class grading, and stage grading

The mean age of all 85 subjects who returned the written forms was 56.0 years (SD ± 11.6, maximum 84.1, minimum 24.2), and the mean disease duration was 10.9 years (SD ± 9.3, maximum 43, minimum 0.4). Regarding the class grad-

ing, there were 38 class I patients and 47 class II patients. Regarding the stage grading, there were 20 stage I patients, 12 stage II, 18 stage III, and 35 stage IV.

Emotional instability and the distribution of psychological problems

Regarding emotional instability, 23.5% of patients were in area I ($n = 20$), 38.8% were in area II ($n = 33$), 29.4% were in area III ($n = 25$), and 8.2% were in area IV ($n = 7$). Therefore, 37.6% of the subjects were diagnosed as having emotional instability.

Table 2 shows the presence or absence of the psychological problems that were surveyed in this study. Based on the psychological tests, subjects were divided into two groups according to whether or not there was any emotional instability, feelings of hopelessness, or suicidal tendencies.

Predictive factors for psychological problems: stepwise multiple logistic regression analysis

Table 3 shows the factors that significantly affect the psychological problems at a risk rate of less than 5%.

Emotional instability. Other factors, namely "not being able to understand the nature of RA disease and its treatment," that their "sense of value had changed after developing RA," the "nonuse of drugs" related to medical treatment, and the "duration of disease (long duration)" in the demographic classification were found to be strong predictive factors of emotional instability.

Table 2. Psychological problems in this study (85 patients)

Psychological problem	Absent (n =)	Present (n =)
Emotional instability	53 (62.4%)	32 (37.6%)
A feeling of hopelessness	73 (85.9%)	12 (14.1%)
Suicidal tendency	77 (90.6%)	8 (9.4%)

A feeling of hopelessness. Of the demographic factors, "a history of smoking" was found to affect the presence of a feeling of hopelessness.

Suicidal tendency. Regarding demographic factors, "a history of smoking" and "class I" affected the presence of a suicidal tendency.

Sixteen patients whose answers were not returned. For the 16 patients who did not give their written consent to testing or whose data were not returned, the mean age was 55.4 years (SD ± 9.4, maximum 70.6, minimum 36.8), and the mean disease duration was 10.4 years (SD ± 5.5, maximum 17.5, minimum 1.5). Regarding the class grading, there were ten class I patients and six class II patients. There were five stage I patients, one stage II patient, four stage III patients, and six stage IV patients. No statistically significant difference was found between the 85 patients for whom we obtained data and the 16 patients listed above regarding their age at the time of investigation, or the disease duration (as examined by the Mann–Whitney U test).

Discussion

We established 22 background factors in this study, and investigated the capability of each to be predictor of psychological problems. Various factors have previously been reported as influencing emotional instability.[19,20] For example, when the CMI was used, it was reported that disease activity or the duration of the disease was strongly related to emotional instability,[19] and another study reported that a high serum opioid peptide concentration (leucine–enkephalin), low lymphocyte subset Leu11/Leu7 cell ratio, and high pain score were related to emotional instability.[20] In this study, we attempted to identify the background factors that were the most effective indicators for such psychological problems as emotional instability, a feeling of hopelessness, and a suicidal tendency in RA patients with limited functional disorders, i.e., class I and II cases, in

Table 3. Results of stepwise multiple logistic regression analyses

	Coefficient	Coef./SE	Odds ratio	P-value
Emotional instability				
Understanding the nature of disease RA and the process of treatment	−1.892	−3.05	0.151	0.0014
Change in patient's sense of value after developing RA	1.773	2.45	5.89	0.0059
Medication (drug use)	−2.746	−2.06	0.0642	0.0193
Length of disease (years)	0.06136	2.05	1.06	0.0362
Constant	1.385	1.10		
A feeling of hopelessness				
Smoking history	1.749	2.08	5.75	0.0496
Constant	−2.037	−5.75		
Suicidal tendency				
Smoking history	2.697	2.68	14.8	0.0082
Class grade*	−1.722	−1.81	0.179	0.0452
Constant	−2.041	−3.99		

*The result means that "class I" is a significant variable

order to start treatment earlier and prevent a progression of psychological problems which could lead to the development of major mental problems and disturb the treatment of the RA disease itself. This point appears to be distinct from the aims of other studies**.**

Discussion of factors affecting emotional instability

Understanding the nature of RA disease and its treatment

We previously reported the study design for this investigation, and pointed out the relationship between understanding a disease and the emotions of patients on hemodialysis and SLE patients.[17,18] The present study also showed that "not understanding the nature of a disease and its treatment" affects emotional instability. It is possible that for patients with a chronic disease, understanding that disease helps to alleviate the anxiety surrounding the emergence of symptoms and the progression of the disease, which cannot easily be predicted.

Most patients have been reported to consider communication with the physician in charge very important, and they also desire the physician's supports.[21] Adequate communication with a physician is therefore a prerequisite for patients to comprehend their disease. In order for patients to acquire an understanding of their disease and its treatment, a physician must communicate with the patient and explain all aspects of their disease, many times if necessary, until they correctly understand its nature and its treatment. An understanding the nature of the disease and its treatment is thought to be an essential step in patient education. Patient education has been reported to have a positive effect in increasing compliance regarding exercise and other treatments,[22] which may also play a role in stabilizing emotions. Not only adequate communication, but also careful and consistent explanations and education are necessary for patients to acquire a sufficient understanding of the nature of their disease and its treatment.

Change in a patient's sense of values after developing RA

Changes in the sense of values of RA patients appears to indicate the strong impact of their disease experience and the changes of subjective experience and cognition in the course of the disease. It has been reported,[23] and is generally accepted, that a change in cognition affects the emotions. Therefore, it can be imagined that a change in the sense of value may provoke emotional instability through the changes in subjective experience or cognition. Therefore, to prevent psychological problems or to treat them at an early stage, it is important to pay attention to subjective experiences and the cognitive aspects of patients as early as possible, and it is also important to analyze the relationship between the cognitive aspects and a patient's emotional instability as represented by changes in values. Further investigations will be needed to find out what kind of value changes specifically cause emotional instability.

Medication (drug use)

The drugs used in the present study were the ones used to treat the underlying disease, namely, steroids, antirheumatic drugs, and nonsteroidal anti-inflammatory drugs. There has been a report[24] that showed a transient quality of life improvement in older RA patients due to the use of drugs, and the results of the present study also showed that the use of drugs can improve emotional instability. To date, there has been no report of any drug that can improve emotional instability itself, but some studies have reported that the drug etanercept can improve RA patients' well-being and functional status,[25] and long-term disease-modifying antirheumatic drug compliance does correlate with psychological well being.[26] As a result, medication may correlate with the patients' physical function while secondarily improving emotional instability. In addition, drug compliance may also be related to the patient's emotional state. Regarding steroids, the steroid dosage prescribed for the subjects in this study was small (all prednisolone at <10 mg/day), and steroids did not appear to have any adverse effect on their emotional state. Multiple pharmacotherapy is generally used to treat RA disease itself. From the results of this study, drug therapy is considered to help improve and stabilize the emotions in patients with emotional instability, as well as improve the effect of the physical treatment.

Duration of the disease

An extended period of disease can cause various kinds of stress accumulation. There have been reports of a strong relationship between a long disease duration and RA emotional instability,[19] and the results of the present study also support these findings. The disease duration has been reported to affect the patient's cognition,[27] which may affect both the patient's understanding of a disease and sense of value, and thus may subsequently influence their emotions.

Discussion of pain

Pain has been previously been reported to be related to emotional instability,[20] but in the present study pain was not a predictive factor of emotional instability. In the present study, factors related to the cognition and experience of the patient, namely "understanding the nature of RA disease and its treatment" and "changes in the patient's sense of value after developing RA," and factors related to medical treatment, namely drug use, and demographic factors, namely the disease duration, were all considered to be stronger independent factors than the physical factor of pain in accounting for emotional instability. The present study targeted class I and II RA patients, who experienced a milder degree of RA disease and of pain. It must first be noted that pain should not seriously impede a person's daily activities in our subjects.

Discussion regarding a feeling of hopelessness and suicidal tendencies

The risk of suicide has been reported to be high among RA patients,[12] but to date there have been no reports analyzing suicidal tendencies in detail. In the present study, smoking was the most effective indicator for such psychological problems as a feeling of hopelessness and suicidal tendencies. Smoking has previously been reported to affect psychological problems and suicide generally.[28–31] These include reports on the relationship between smoking and anxiety and depression,[28] reports that smoking is an important factor related to suicide attempts,[29] indications that smoking is a trigger of destructive behavior in adolescents,[30] and reports that smoking is a characteristic background factor of suicides, as well as of low academic history and psychiatric disorders.[31] In the present study, we also found a significant correlation between smoking and a feeling of hopelessness, and smoking and a suicidal tendency, and thus smoking was again recognized to be an important factor that could not be overlooked when dealing with psychological problems in RA patients. Regarding the relationship between smoking and RA itself, smoking has also been reported to act as a risk factor in the development of RA.[32] Regarding pain, smoking has been pointed out as a factor related to back pain in osteoarthritis.[33] It is therefore thought that from both physical and mental perspectives, careful attention should be paid to smoking. In future, a detailed analysis of the motivation to smoke and changes in the number of cigarettes smoked may be useful in the prevention of suicide and a feeling of hopelessness.

It is noteworthy that class I patients had a greater "suicidal tendency" than class II patients. This may be related to the problem of acceptance of the disease in its initial stage. The fact that a suicidal tendency was high in the class I group of patients in whom the dysfunction is mostly not recognized indicates that these patients should not be neglected in terms of psychological care and attention.

Conclusions

The results of this study showed that in RA outpatients with limited functional disorders, the factor related to the experiences of the person and patient's cognition, namely that their "sense of value had changed after developing RA," the factor related to the patient's self-awareness, namely "not being able to understand the nature of RA disease and its treatment," factors related to medical treatment, such as the nonuse of drugs, and to demographics, such as the duration of the disease, were found to be greater predictive factors of emotional instability than such factors as pain, CRP, and others that were previously thought to affect the mental condition of RA patients. It will be necessary to conduct farther detailed analyses regarding the multifaceted implications of patient cognition, subjective experiences, drug administration, and the disease duration. In addition, the fact that smoking strongly affects the specific psychological problems of suicidal tendencies and a feeling hopelessness also needs to be adequately addressed. Based on the results of the present study, it is speculated that the early implementation of a treatment program which improves patient cognition, appropriate drug therapy, and lifestyle guidance would be effective against emotional instability and the psychological problems of RA patients with a relatively limited dysfunction. The health status impact in patients with recent-onset RA has been reported to be similar in magnitude to that for more established diseases,[34] and thus it is desirable to establish an adequate methodology for psychological care as early as possible, based on the findings of this study.

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