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Regular Article

Emotional state and coping style among gynecologic patients undergoing surgery

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Abstract

The aim of the present study was to investigate changes in emotional state and the relationship between emotional state and demographic/clinical factors and coping style among gynecologic patients undergoing surgery. Using the Japanese version of the Profile of Mood States (POMS), 90 patients (benign disease: 32, malignancy: 58) were examined on three occasions: before surgery, before discharge, and 3 months after discharge. They were also examined using the Coping Inventory for Stressful Situations (CISS) on one occasion before discharge. The scores for the subscales depression, anger, and confusion were the highest after discharge while those for anxiety were the highest before surgery. The average scores of the POMS subscales for all subjects were within the normal range. With regard to the relationship between these emotional states and other factors, multiple regressions showed that the principal determinants of anxiety before surgery were religious belief, psychological symptoms during hospitalization and emotion-oriented (E) coping style; further, it was found that depression after discharge could be explained by chemotherapy, duration of hospitalization, and E coping style. The principal determinants of anger after discharge and vigor before surgery were length of education and E coping style, and severity of disease, chemotherapy, E coping style and task-oriented coping style, respectively. Those of post-discharge fatigue and confusion were length of education, psychological symptoms, and E coping style. In summary it is suggested that the following should be taken into account in patients undergoing gynecologic surgery: anxiety before surgery, depression, anger, and confusion after surgery, including coping styles.

INTRODUCTION

Since the 1980s, many studies in the field of psycho-oncology have investigated the relationship between coping style and psychological distress, such as depression, among cancer patients.[1–5] Results have suggested

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that focusing on the coping style of patients and attempting to influence coping style might reduce deterioration in the quality of life (QOL). The effects and usefulness of such interventions have therefore been investigated.[6–8] In particular, in addition to psychiatric outcome, the effect of these interventions on prognosis has been reported.[9,10] However, the majority of such studies have focused on patients with breast cancer, and few have investigated the relationship between psychological distress and the coping style of patients with gynecologic cancer.

Patients with gynecologic disease, including cancer, who are undergoing surgery, can be particularly vul-

nerable to distress associated with damage to self-image, altered sexual function, and loss of fertility,[11-19] in addition to general preoperative stress. Furthermore, approximately 30% of cancer patients are reported to be diagnosed with depression or adjustment disorders.[20,21] We must therefore take into account psychiatric complications among gynecologic cancer patients. Compared to studies conducted in Europe and America, in Japan fewer studies have investigated the perioperative emotional state among gynecologic patients, including those with cancer.

In the present study on gynecologic patients, the aim was to investigate the emotional state in the perioperative period and to ascertain the relationship between emotional state and other factors, including coping style, using self-administered questionnaires. We used the Profile of Mood States (POMS)[22] as a scale for estimating emotional state, and the Coping Inventory for Stressful Situations (CISS)[23] as a scale for coping style. We selected POMS and CISS because these scales are used internationally, and the subjects using these scales are not limited to the members of a particular group such as cancer patients.

We hypothesized that gynecologic patients undergoing surgery are likely to perioperatively exhibit particular psychological symptoms, irrespective of whether or not the patient has cancer. In addition, we hypothesized that the emotional state of the patient is related to their coping style, in particular, the emotion-oriented (E) coping style that has been reported as a maladaptive coping style by many researchers.[24-28] We predicted that there should be timely intervention in gynecologic patients undergoing surgery who exhibit psychological symptoms; further, patient characteristics, including coping styles, should be focused on perioperatively.

METHODS

Sample

The subjects consisted of 98 patients who were admitted to the Department of Obstetrics and Gynecology, Tokyo Medical and Dental University Hospital between June 2002 and March 2004 for the surgical treatment of gynecologic disease, including cancer. Patients with cognitive impairment and those undergoing psychiatric treatment were excluded. Two patients did not consent to participate in the study; a further four subsequently withdrew consent or dropped out due to deterioration in physical condition and two patients died before discharge. Consequently, 90 patients (mean age ± SD, 46.9 ± 13.1 years) participated in the present study. Of these, 32 were diagnosed

with benign disease (mean age, 41.0 ± 11.3 years) and 58 with malignancy (mean age, 50.2 ± 13.0 years). Patients who dropped out from the study after the first examination day were all cancer patients. There was no difference in the other clinical/demographic factors.

The following diagnoses were made in the benign group: ovarian tumor ($n = 16$), tubo-ovarian abscess ($n = 10$), and other tumors including cervical adenoma ($n = 6$). The diagnoses in the malignant group were as follows: cervical cancer ($n = 28$), cancer of the uterine body ($n = 12$), and ovarian cancer ($n = 18$). The following surgical procedures were performed: laparotomy ($n = 55$), conization ($n = 19$), and adnexectomy ($n = 16$). In the malignant group, tumor extension was classified according to the general classification rules for gynecologic cancer.[29,30] Patients at disease stage 0, I, or II were classified as the early stage group ($n = 47$) and those at stages III or IV as the advanced-stage group ($n = 11$). Table 1 shows the average age, length of education, duration of hospitalization, habitation status, employment status, location of tumor, progress, surgical treatment, and chemotherapy administration in the benign and malignant groups. No cancer patient received chemotherapy and/or radiotherapy after discharge. The two groups exhibited no significant difference in demographic/clinical factors, such as length of education, habitation status, employment status, or surgical treatment. In contrast, significant differences were observed in age, duration of hospitalization, and location of tumor. All patients were informed of their diagnoses before admission, and when the diagnosis was not confirmed preoperatively, the cancer patients were told that the findings were 'suspicious of cancer'. There were five such patients. There was no patient with benign disease in whom cancer was suspected.

Measures

Following routine admission and stabilization, informed consent was obtained from each patient. Two self-administered questionnaires were used. The patients' emotional state was evaluated using the Japanese version of POMS,[31-33] and coping style was measured using the Japanese version of CISS.[34,35] The POMS questionnaire was administered on three occasions: before surgery, before discharge, and 3 months after discharge. In contrast, CISS was administered only before discharge.

POMS assesses six emotional states: tension–anxiety, depression, anger–hostility, vigor, fatigue, and confusion; a higher score (in the case of vigor, a lower score) indicates a more severe emotional state. These subscales were standardized according to the consecutive studies of Yokoyama and Araki[33]: scores lower

Table 1. Sociodemographic subject characteristics

	Benign group ($n = 32$)		Malignant group ($n = 58$)			
	Mean/number	SD/%	Mean/number	SD/%	d.f./t, χ^2	P
Age (years)	41.0	11.3	50.2	13.0	d.f. = 88/t = 3.372	0.0011
Length of education (years)	14.0	1.8	13.0	2.3	d.f. = 88/t = −1.939	0.0566
Duration of hospitalization (days)	14.0	5.3	28.2	25.4	d.f. = 88/t = 3.109	0.0025
Habitation status						
Single	6	18.8	12	20.7	d.f. = 2/χ^2 =0.438	0.8032
Spouse only	7	21.9	17	29.3		
Others	19	59.4	29	50.0		
Employment status						
Employed	13	40.6	24	41.4	d.f. = 1/χ^2 =1.78E-30	>0.999
Unemployed	19	59.4	34	58.6		
Location of tumor						
Uterine cervix	2	6.3	28	48.3	d.f. = 2/χ^2 =29.354	<0.0001
Uterine body	1	3.1	12	20.7		
Ovary	29	90.6	18	31.0		
Progress						
Early	NA	NA	47	81.0	NA	NA
Advanced	NA	NA	11	19.0		
Surgical treatment						
Laparotomy	17	53.1	38	65.5	d.f. = 1/χ^2 =1.161	0.2812
Conization/others	15	46.9	20	34.5		
Chemotherapy						
(+)/(−)	0/32	0/100	15/43	25.9/74.1	NA	NA

NA, not applicable.

than average + SD (scores are based on data collected from these studies) indicate 'no emotional problem', scores between average + SD and average + 2.4 SD indicate that 'medical attention is advised in the event of symptoms', and scores of average + 2.5 SD or more indicate that 'medical attention is necessary'. In the present study we used standardized scores that were converted from raw scores.

CISS was used to determine the typical coping style of the subjects during the most stressful situations. CISS assesses the following three coping styles: task-oriented (T) coping style, emotion-oriented (E) coping style, and avoidance-oriented (A) coping style, and includes a total of 48 items (16 items for each coping style); a higher score indicates that the coping style is often used. Coping style is defined as the typical cognitive/behavioral pattern adopted most often during stressful situations.[23,34,35] We assumed that although this style might vary depending on the occasion, an individual's coping style is a type of character trait. We therefore assumed that coping style would be more likely to affect emotional state than vice versa. CISS was selected as a measurement of coping style because it is often used as an international scale, thereby enabling us to compare our findings with those of other studies. Further, the reliability and validity of the Japanese version of CISS have been confirmed, and this scale can be used for both patients with benign disease and cancer patients.

Statistical analyses

For statistical analysis, the demographic/clinical data between the benign and malignant groups was compared using Student's t-test and the χ^2 test. The change in each POMS subscale score over the three test administration days was analyzed using repeated measures analysis of variance (ANOVA) with post-hoc comparisons (Scheffe's F-test; 95% significance). Multiple regressions were subsequently performed by treating the factors (including the CISS scores) significantly related to the POMS scores as independent variables and the POMS scores as dependent variables. This was done in order to assess determinants of the POMS subscale scores exhibiting the greatest deterioration. $P < 0.05$ was considered significant.

RESULTS

Emotional states over the three test administration days

On all occasions, the POMS scores for all subjects were within normal range. Significant differences in the tension–anxiety, depression, anger–hostility, and confusion scores were evident across the three test administration days (tension-anxiety: $F = 9.356$, $P = 0.0001$; depression: $F = 6.819$, $P = 0.0015$; anger–hostility: $F = 15.101$, $P < 0.0001$; confusion: $F = 3.956$, $P = 0.0211$). For vigor and fatigue, no significant difference was apparent in the values of the scores over the

study period. In summary, the tension–anxiety score was the highest before surgery, and the depression, anger–hostility, and confusion scores were the highest after discharge (Table 2).

Furthermore, with the exception of anger–hostility, no significant difference was apparent in the POMS subscales between the three groups (benign, early stage, advanced-stage groups) across the three test administration days. The anger–hostility score was the lowest in the advanced-stage group and the highest in the benign group ($F = 4.016$, $P = 0.0220$); post-hoc tests showed that there was a significant difference between these two groups with regard to this score.

Table 2. POMS subscale scores (±SD) in the three groups (benign, early stage, and advanced-stage) over the three examination days

Subscales	Before surgery	Before discharge	Three months after discharge
Tension-anxiety			
All subjects	47.7 ±10.6	42.0 ±9.2	43.9 ±10.3[†‡]
Benign group	49.7 ±11.8	42.6 ±10.8	45.6 ±11.0
Early stage group	46.4 ±11.1	42.1 ±9.7	44.2 ±10.8
Advanced-stage group	48.4 ±5.6	39.8 ±5.3	38.7 ±3.0
Depression			
All subjects	46.3 ±9.0	44.0 ±6.6	47.8 ±10.8[§]
Benign group	47.2 ±8.6	44.8 ±7.7	48.2 ±10.0
Early stage group	45.4 ±8.7	43.8 ±6.9	49.0 ±12.1
Advanced-stage group	45.8 ±5.7	42.5 ±3.5	41.7 ±2.4
Anger-hostility			
All subjects	42.3 ±5.7	40.2 ±4.3	44.4 ±8.5[†‡§]
Benign group	44.8 ±5.6	40.2 ±3.5	46.4 ±8.0
Early stage group	41.3 ±5.3	40.1 ±4.9	44.5 ±9.2
Advanced-stage group	39.1 ±1.1	39.0 ±1.8	39.2 ±2.2
Vigor			
All subjects	48.5 ±9.6	51.4 ±11.1	51.0 ±11.2
Benign group	45.0 ±10.5	50.0 ±12.5	50.8 ±11.6
Early stage group	52.6 ±7.7	53.2 ±11.2	51.1 ±12.1
Advanced-stage group	42.3 ±8.1	48.9 ±10.9	51.5 ±5.3
Fatigue			
All subjects	43.3 ±9.1	43.0 ±9.6	44.7 ±9.7
Benign group	46.1 ±9.8	44.0 ±11.0	46.8 ±10.3
Early stage group	41.0 ±7.8	41.4 ±8.9	44.6 ±9.8
Advanced-stage group	47.9 ±9.6	43.3 ±9.6	40.5 ±6.0
Confusion			
All subjects	44.4 ±10.5	42.1 ±8.8	45.3 ±11.5[§]
Benign group	46.8 ±10.8	42.9 ±10.1	46.6 ±11.0
Early stage group	42.0 ±10.5	40.8 ±8.8	46.2 ±12.3
Advanced-stage group	45.2 ±8.2	43.2 ±7.5	37.9 ±5.8

[†] Significant differences between before surgery and discharge; [‡] significant differences between before surgery and after discharge; [§] significant differences between before discharge and after discharge.

Two-way analysis of variance (ANOVA) repeated measures.

Multiple comparison was analyzed by Scheffe ($P < 0.05$; Scheffe), between 3 days (before surgery, before discharge, after discharge) for all subjects, and between three groups.

POMS, Profile of Mood States.

Clinically, three patients demonstrated psychological symptoms such as depressed mood from before surgery to before discharge (during hospitalization). One patient was diagnosed with depression before discharge (her gynecologic diagnosis was benign), and the other two patients were diagnosed with adjustment disorder (all had benign disease).

Relationship between POMS and demographic/clinical parameters

We selected the presurgery tension–anxiety and vigor scores and the post-discharge depression, anger–hostility, fatigue, and confusion scores as dependent variables because these were the highest scores (in the case of vigor, the lowest scores) over the study period.

Next, we performed the following process for selecting the dependent variables for each regression model. First, we analyzed the relationship between POMS and other demographic/clinical factors (continuous variables) including the coping style by using Pearson's correlation test. Second, we analyzed the relationship between POMS and other demographic/clinical factors (nominal variables) by using two-way ANOVA with repeated measures. Third, we confirmed the multicollinearity by analyzing the relationship between the significant demographic/clinical factors (continuous variables) other than POMS by using the

Pearson's correlation test. The following results were obtained.

With regard to the relationship between POMS and clinical parameters, Pearson's correlation test results showed that variables such as CISS scores, age, length of education, and duration of hospitalization were related to the POMS subscale scores (Table 3). The results of two-way ANOVAS with repeated measures showed that variables such as benign/malignant group, religion, chemotherapy, administered during hospitalization, and psychological symptoms during hospitalization were significantly related to the POMS subscales. With regard to the relationship between the significant clinical parameters, including the CISS scores, Pearson's correlation test results indicated significant relationships between the age and duration of hospitalization ($r = 0.369$, $P = 0.0013$), age and length of education ($r = -0.532$, $P < 0.0001$), age and E coping style scores ($r = -0.313$, $P = 0.0071$), duration of hospitalization and length of education ($r = -0.410$, $P = 0.0003$), and E coping style scores and A coping style scores ($r = 0.320$, $P = 0.0058$).

Taking these results into account, we attempted multiregression analyses with some combinations of independent variables, and we were able to achieve the most adaptive model (the best combination of the independent variables) for each dependent variable. Table 4 shows the results of those multiple regression

Table 3. Variables significantly related to the POMS subscale scores (Pearson's correlation tset)

Variables: demographic/clinical factors and coping style(CISS scores)	POMS subscale scores	r	P
CISS scores			
Task-oriented coping style	T-A before discharge	−0.267	0.0249
	V before discharge	0.388	0.0008
	C before discharge	−0.253	0.0344
Emotion-oriented coping style	All POMS scores except for V before discharge	0.263–0.612	<0.0001–0.0278
Avoidance-oriented coping style	T-A after discharge	0.332	0.0048
	D after discharge	0.317	0.0073
	A-H after discharge	0.292	0.0137
	F after discharge	0.267	0.025
	C after discharge	0.315	0.0076
Age	D before surgery	−0.270	0.0236
	A-H before surgery	−0.270	0.0234
	C before surgery	−0.251	0.0357
	D before discharge	−0.300	0.0112
	F after discharge	−0.238	0.0469
Length of education	V before surgery	0.242	0.0434
	C after discharge	0.263	0.0278
Duration of hospitalization	F before discharge	0.259	0.0301

A-H, Anger–Hostility; C, Confusion; CISS, Coping Inventory for Stressful Situations; D, Depression; F, Fatigue; POMS-J, Japanese version of Profile of Mood States; T-A, Tension–Anxiety; V, Vigor.

Table 4. Final multiple regression model for predicting POMS scores

Dependent variables	Independent variables	β	SE	P	R^2	F/P
Tension–Anxiety before surgery	Age	0.099	0.124	0.2699	0.270	3.198/0.0024
	Religious beliefs	8.196	0.210	0.0411		
	Severity of disease	−1.794	−0.082	0.4468		
	Chemotherapy	−8.098	−0.289	0.1845		
	Psychiatric symptom	−10.236	−0.263	0.0118		
	Duration of hospitalization	−0.149	−0.306	0.1558		
	Task-oriented coping style	−0.093	−0.121	0.2290		
	Emotion-oriented coping style	0.331	0.332	0.0035		
	Avoidance-oriented coping style	0.051	0.058	0.5706		
Vigor before surgery	Age	0.033	0.045	0.6759	0.324	4.736/<0.0001
	Religious beliefs	−0.567	−0.016	0.8691		
	Severity of disease	5.181	0.260	0.0130		
	Chemotherapy	15.236	0.598	0.0046		
	Psychiatric symptom	0.664	0.019	0.8478		
	Duration of hospitalization	0.105	0.239	0.2437		
	Task-oriented coping style	0.207	0.297	0.0023		
	Emotion-oriented coping style	−0.218	−0.241	0.0206		
Depression after discharge	Age	0.063	0.075	0.5758	0.464	5.019/<0.0001
	Length of education	1.006	0.197	0.1376		
	Religious beliefs	3.370	0.093	0.3751		
	Severity of disease	2.224	0.097	0.3802		
	Chemotherapy	14.300	0.525	0.0178		
	Psychiatric symptom	−6.655	−0.171	0.0997		
	Duration of hospitalization	0.265	0.565	0.0092		
	Task-oriented coping style	−0.089	−0.113	0.2815		
	Emotion-oriented coping style	0.475	0.479	0.0001		
	Avoidance-oriented coping style	0.146	0.155	0.1409		
Anger-Hostility after discharge	Age	0.128	0.194	0.1841	0.377	3.517/0.0011
	Length of education	1.160	0.287	0.0459		
	Religious beliefs	1.157	0.040	0.7197		
	Severity of disease	−1.128	−0.062	0.6001		
	Chemotherapy	6.664	0.310	0.1869		
	Psychiatric symptom	−0.547	−0.018	0.8721		
	Duration of hospitalization	0.116	0.314	0.1696		
	Task-oriented coping style	−0.058	−0.093	0.4123		
	Emotion-oriented coping style	0.390	0.498	0.0002		
	Avoidance-oriented coping style	0.107	0.144	0.2036		
Fatigue after discharge	Age	0.057	0.075	0.6070	0.366	3.347/0.0017
	Length of education	1.694	0.366	0.0100		
	Religious beliefs	0.245	0.007	0.9477		
	Severity of disease	−0.731	−0.035	0.7689		
	Chemotherapy	6.743	0.273	0.2474		
	Psychiatric symptom	−9.091	−0.258	0.0238		
	Duration of hospitalization	0.179	0.422	0.0690		
	Task-oriented coping style	−0.013	−0.018	0.8737		
	Emotion-oriented coping style	0.301	0.336	0.0100		
	Avoidance-oriented coping style	0.111	0.130	0.2535		

Table 4. *Continued*

Dependent variables	Independent variables	β	SE	P	R²	F/P
Confusion after discharge	Age	0.145	0.160	0.2511	0.429	4.349/0.0001
	Length of education	2.144	0.388	0.0056		
	Religious beliefs	3.322	0.085	0.4327	.	
	Severity of disease	1.372	0.055	0.6265		
	Chemotherapy	9.375	0.319	0.1570		
	Psychiatric symptom	−10.775	−0.256	0.0183		
	Duration of hospitalization	0.159	0.315	0.1512		
	Task-oriented coping style	−0.090	−0.106	0.3289		
	Emotion-oriented coping style	0.430	0.403	0.0014		
	Avoidance-oriented coping style	0.179	0.175	0.1078		

POMS-J, Japanese version of Profile of Mood States.

analyses. Presurgery tension–anxiety scores for non-religious patients were higher than those for religious patients. Presurgery tension–anxiety scores and fatigue/confusion scores after discharge were higher in patients with psychological symptoms than patients without them. Depression scores after discharge and vigor scores before surgery for patients who underwent chemotherapy were lower than those for patients who did not receive chemotherapy. The longer the duration of hospitalization, the higher were the patients' depression scores. The longer the length of education, the higher were the patients' anger–hostility, fatigue, and confusion scores after discharge. Presurgery vigor scores were higher in cancer patients and patients with high T coping style scores than in other patients. Furthermore, presurgery tension–anxiety and vigor, and post-discharge depression, anger–hostility, fatigue, and confusion scores were higher (in the case of vigor, lower) for patients with high E coping style scores than for those with low E coping style scores.

DISCUSSION

Change in emotional state over the study period

With regard to changes in emotional state, the present results showed that over the study period, depression and anger changed in a different manner as compared to anxiety. While anxiety was the highest before surgery, depression and anger were maximal 3 months after discharge. High anxiety before surgery might be due to general concerns regarding the surgery itself. In contrast, high depression and anger after discharge might be attributed to psychological distress associated with damage to self-image, altered sexual function, and loss of fertility.[11–19] Such distress appears to be overt after discharge when the patient's physical condition has improved.

Previously, we investigated the psychological state of gastrointestinal patients (including cancer patients) undergoing surgery. We found that depression increased from before surgery to before discharge and had not recovered to presurgery levels 6 months after discharge; but the scores for anxiety did not change over the study period.[36] Although it is evident that patients with gastrointestinal disease differ from those with gynecologic disease in terms of parameters such as gender and physical status, the two studies showed similar results with regard to the following two points: (i) depression changed significantly over the study period; and (ii) the changing pattern of anxiety was different from that of depression. In conclusion, we should focus on the timely initiation of treatment or care to gynecologic patients. For example, we should communicate to patients with gynecologic disease taking into account their anxiety, and offer preoperative orientation and explanation about surgery. Furthermore, follow-up psychological examinations should be carried out by skilled experts to evaluate patient deteriorated emotional states such as depression, anger, and confusion. The routine psychological screening test carried out during follow up after discharge might be useful.

Incidence of psychiatric disease and the level of emotional state over the study period

All the POMS average scores for all subjects were within the standard range for each subscale on all test administration days. Furthermore, only three of 90 subjects had psychological symptoms warranting psychiatric diagnosis. Hence, the morbidity rate was relatively low at 3.3% when compared with findings from previous studies that investigated psychiatric morbidity rates among cancer patients.

Using the Center for Epidemiologic Studies Depression Scale (CES-D) and the State–Trait Anxiety Inven-

tory (STAI) as depression/anxiety evaluation scales, Bodurka-Bevers *et al.* investigated depression and anxiety among patients with ovarian cancer (26% of subjects had early stage cancer, 74% had advanced-stage cancer, and 49% were undergoing active treatment).[37] They reported that scores exceeded the threshold for depression in 21% of all subjects and scores for anxiety exceeded 75% of the average scores in 29% of all subjects. In the present study, the fact that the POMS average scores were all within the normal range might be explained by differences in the measurements used and the inclusion of subjects with benign tumors and the fact that patients with early stage disease outnumbered those with advanced-stage disease in the present study. In contrast, our study showed that the emotional status of advanced-stage patients was not different from that of benign and early stage patients. This contradiction might be because there were only a few advanced-stage patients in the present study and their physical condition was not severe.

Next, Tanaka *et al.* reported that 29.2% of gynecologic cancer patients who had been informed of their diagnosis were diagnosed with psychiatric diseases within 1 week of being given the diagnosis.[38] In the present study, preoperative tests were administered some weeks after the patients were informed of their diagnosis; this might contribute to differences between the Tanaka *et al.* findings and those of the present study.

We now discuss our findings that there was no difference in most POMS subscale scores between the benign, early stage, and advanced-stage groups and the finding that the anger–hostility score was higher in the benign group than in the advanced-stage group. As for the former observation, the physical condition of the advanced-stage patients in the present study was not severe. Additionally, Lutgendorf *et al.* investigated QOL and mood in women with gynecologic cancer at an initial clinic visit and after 1 year by using FACT (measuring QOL) and POMS.[39] They reported that QOL and mood improved among the early stage and regionally advanced oncology patients and that there was no significant difference between the two patient groups in the level of and change in mood over time. Their finding is consistent with the present findings. Irrespective of whether the patients have cancer or whether their cancer is at an early or at an advanced stage, most distress common to all gynecologic patients undergoing surgery might be associated with concerns other than surgery, cancer, and the disease itself. Furthermore, as for the second finding (that the anger–hostility score was found to be higher in the benign group than in the advanced-stage group), we did not obtain the same results in proceeding studies in gyne-

cologic patients. However, because gynecologic patients with benign diseases have no fear of cancer, that is, they are not severely anxious, feelings such as anger and hostility might be exhibited to a greater extent by these patients than by cancer patients. In fact, through clinical experience in gynecologic wards we confirmed that strong negative emotions such as fear and anxiety often prevail over anger and hostility.

Relationship between emotional state and demographic/clinical parameters

Anxiety before surgery was related to religious beliefs and to the E coping style. In crisis situations, patients with religious beliefs might experience less stress than non-religious patients. Jarvis *et al.* examined the relationship between religious practice and psychological distress in a culturally diverse urban population, and confirmed that attendance at religious services was related to lower levels of distress.[40] Salsman *et al.* investigated the relationship between religiousness and adjustment (distress and life satisfaction) and between spirituality and adjustment; they reported that intrinsic religiousness and prayer fulfillment are related to life satisfaction, and that life satisfaction is mediated by optimism and social support.[41]

Moreover, it appears plausible that patients exhibiting psychological symptoms during hospitalization are more likely to feel anxiety, fatigue, and confusion after discharge than those who do not exhibit psychological symptoms. It also appears plausible that patients who underwent long hospitalization stays were more depressed after discharge than those who underwent a short hospitalization. With regard to the finding that scores for anger, fatigue, and confusion after discharge were lower among patients with short-term education, many previous studies showed that gynecologic patients are more likely to suffer from distress associated with loss of female identity and self-image than that resulting from the disease itself.[11-19] The cognitive scheme against such distress might be related to the length of education. However, this scheme is assumed to be different from coping styles because the length of education affected patient mood after discharge independently of coping styles. In contrast, it is unclear why vigor scores before surgery were higher for cancer patients than for patients with benign diseases, and why depression scores after discharge were lower for patients who underwent chemotherapy than for those who did not.

Corney *et al.* investigated psychological and sexual distress among patients with uterine and vulval cancer undergoing surgery by using interview methods incorporating HADS.[42] They reported that anxiety was not

related to age or surgical methods and sexual problems were significantly related to the anxiety level. In addition Greimel and Freidl investigated daily living and psychological well-being among gynecologic cancer patients perioperatively; they reported that the scores were not significantly related to age, tumor location, or disease progression.[43] Therefore, although we cannot make a simple comparison, their findings regarding age, tumor location, surgical methods, and disease progression appear to be consistent with the present findings.

Relationship between emotional status and coping style

After the multicollinearity in the regression model was considered, the present findings suggested that anxiety and vigor before surgery and depression, anger, fatigue, and confusion after discharge depend on the individual's coping style. In particular, the E coping style had a great influence on all emotional states. Previous studies using CISS have reported that among the various population, the E coping style is related to negative psychological states, personality, or psychiatric pathology.[24-28] Some studies have also reported that the T coping style is related to positive personality traits.[27,28] These findings are similar to those of the present study. From the standpoint of optimizing mental health and promoting comprehensive patient care, concrete strategies should focus on the coping style of gynecologic patients, particularly the E coping style. Patients who cope emotionally should be enrolled in a psychoeducational program focusing on adjusting coping style.

CONCLUSION

The present study clarified perioperative changes in the emotional state in gynecologic patients undergoing surgery, and the relationship between these and multiple related factors. In particular, the findings showed that there are not many differences between the mood of patients with benign disease and those with cancer. Additionally, the findings elucidated the characteristics of subjects who should receive more clinical attention. However, although we were able to identify these characteristics, it is difficult to extrapolate these findings into concrete methods for care or intervention for characteristics such as the physical condition of patients, types of treatments, and patient background such as educational length. In contrast, with regard to coping style, it is not impossible to prompt patients to alter their cognitive style and to urge them to use a more adaptive style through therapy such as psychoe-

ducational group therapy. Furthermore, considering that almost all the psychological variables studied changed over the perioperative period, it can be concluded that timely intervention taking into account individual treatment conditions and situations is important.

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A Comparison of Psychiatric Consultation–Liaison Services Between Hospitals in the United States and Japan

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The authors investigated psychiatric consultation in two hospitals, one in the United States, the other in Japan. They examined similarities and differences, and drew inferences on possible cross-cultural values and/or temporary cultural conditions. As compared with the Japanese consultation patients, the Americans had more mood disorders, including anxiety and chemical-dependency problems, in respective diagnostic classifications. Patients in the United States also showed more acute as well as more serious chronic conditions. These differences may relate to disorder base-rates in the respective countries. In general, psychosocial problems emerged as ascendant in Japan, as compared with chemical-dependency difficulties among American patients. The results are discussed in terms of current conditions in Japan that affect the mental health professions, together with attempts by Japanese clinicians to protect collective mores by ascribing causation for disorders to the individual, rather than the societal conditions often invoked in the United States.   (Psychosomatics 2007; 48:517–522)

The aim of this study is to explore possible similarities and differences between two hospital consultation services, one in a major American city in Minnesota (catchment area: 3 million), the other in the central part of Kanagawa, Japan (catchment area: 1 million). Heretofore, investigations of consultation–liaison services have involved comparisons between the United States and countries in Europe. It was reasoned that the notable differences between the United States and Japan in areas such as cultural, healthcare systems, and political structures might be reflected in the nature of the patients referred for psychiatric consultation.

METHOD

The participants included patients consecutively referred to the psychiatric consultation–liaison service of Fairview University Medical Center at the University of Minnesota (from January 1, 2001 through December 31, 2001) and the Psychiatric Service of Tokai University Hospital, Kanagawa, Japan. The Japanese referrals occurred from July 1, 2003 through June 30, 2004. This period was selected because of a major change in the Japanese system, from "fee-for-service" to a "lump-sum" payment system with

the adoption of the Diagnostic Procedure Combination System.

The hospital in the United States is public, located in a catchment area of approximately 3 million people (with approximately 15% non-Caucasian minorities). During the study year, the hospital had 17,629 admissions. The average length of stay (LOS) was 5.7 days. The consultation team consisted of an attending psychiatrist, psychiatric residents, and medical and pharmacy students.

In Japan, the institution is a private, university hospital, located in the central part of Kanagawa, with a population of over 87 million. However, its catchment area has approximately 1 million persons. During the study year, the hospital had 16,903 admissions, with an average LOS of 15.7 days. The consultation team consisted of attending psychiatrists and psychiatric residents. Thus, in both hospitals, a monodisciplinary medical-consultant model was followed, consistent with those in larger university hospitals with restricted involvement of other psychosocial services.[1]

The following information was recorded for each consultation both in the United States and Japan: patient demographics (Table 1), date of admission, date of consultation, referring specialty service, reason for referral (Table 2), and DSM-IV diagnosis,[2] on the basis of information gleaned from the consultation interview. The LOS for each patient was obtained from the hospital computer systems. Consultations were requested primarily by four specialty services: medicine, surgery, intensive-care unit, and family practice. Other medical services provided fewer referrals; these included ophthalmology, obstetrics and gynecology, radiology, and pediatrics.

Reasons for referral included suicidal ideation and/or suicidal behavior; depression; psychosis; substance abuse or dependency; requests for evaluation of psychotropic medications; or the assessment of unspecified mental conditions, competence, or refusal of treatment; behavioral problems; agitation; anxiety; confusion or delirium; somatic complaints (somatization, factitious disorder, or malingering); and conditions listed as "other." Corresponding DSM-IV psychiatric diagnoses are presented in Table 3.

Regarding the timing of consultation, it would be inappropriate to investigate the number of days from admission to consultation, since this would be confounded by the LOS itself. For example, patients who are in the hospital longer could have the potential for receiving a later psychiatric consultation. For this reason, several investigators have suggested transforming the timing of referral into one adjusted for LOS by use of the following formula:[3–5]

$$\text{Timing of Consultation} = \log \ (\# \text{ days from admission to consultation})/\log \ (\text{LOS})$$

This means that the LOS is adjusted for the percentage of hospital stay occurring before consultation.

Statistical Analysis

Two-sample t-tests were computed, based on equal or unequal variances, using the Levene test. Chi-square tests were used to compare categorical data. When sample sizes were prohibitively small, we used Fisher's exact test.

RESULTS

Background characteristics of the United States and Japanese psychiatric-consultation patients are presented in

TABLE 1. Background Characteristics, N (Percent)			
	United States	Japan	Comparison Statistics
Sex, male	285 (52.7)	237 (59.4)	$\chi^2 = 4.20$; p = 0.040
Married	183 (34.1)	233 (63.7)	$\chi^2 = 6.27$; p <0.001
Employed	169 (32.2)	141 (43.0)	$\chi^2 = 1017$; p = 0.001
Mean age, years (SD)	49.2 (16.3)	54.6 (17.9)	
Referring Unit			
Medical	234 (43.3)	140 (35.1)	
Surgical	97 (17.9)	138 (34.6)	
Intensive care	59 (10.9)	19 (4.8)	
Family (general) medicine	123 (22.7)	67 (16.8)	
Other	28 (5.2)	35 (8.8)	
Past psychiatric history	385 (74.7)	162 (44.3)	$\chi^2 = 81.39$; p <0.001
Days from admission to consult, mean (SD)	6.9 (15.6)	162 (44.3)	$t[641] = 5.2$; p = 0.004
Length of hospital stay, mean (SD)	17.9 (34.1)	43.5 (48.6)	$t[673] = 9.0$; p <0.001
SD: standard deviation.			

Table 1. North American patients included a smaller percentage of men, and fewer who were married; there was a smaller percentage of employed patients, and they tended to be younger in age. They also included significantly more patients with a previous history of psychiatric illness. In the Minneapolis hospital, 541 patients (3.1%) were evaluated by the psychiatric consultation team, whereas, in Kanagawa, 399 patients (2.4%) were evaluated.

Reasons for referral and psychiatric diagnoses are presented in Tables 2 and 3, respectively. The American physicians more frequently requested evaluations for possible suicidal proclivities, depression, and chemical dependencies. Japanese physicians more frequently asked for evaluations for agitation, anxiety, delirium, general psychiatric issues, and, importantly, social adjustment topics. Concerning diagnoses, the Minneapolis patients received more

mood-disorder, anxiety, and drug-dependency classifications. A significantly higher number of Japanese consultation referrals received no psychiatric diagnoses. Also, the American patients were in greater distress (i.e., with Axis IV designations) and evinced greater severity of presenting problems in terms of Global Assessment of Functioning (GAF) judgments. The difference in timing (using the above formula) was not significant between the two hospitals (+0.35/−0.50 and +0.30/−0.60; $t[938] = 1.5$; p = 0.13).

DISCUSSION

To our knowledge, no previous studies have explored cross-national psychiatric consultation services comparing Western and Asian countries. Our investigation suggests

TABLE 2. Reason for Referral, N (Percent)

	United States	Japan	Comparison Statistics
Suicidal concerns	62 (11.5)	28 (7.0)	$\chi^2 = 5.32$; p = 0.021
Depression	191 (35.4)	76 (19.0)	$\chi^2 = 30.24$; p < 0.001
Psychosis	33 (6.1)	23 (5.8)	NS
Chemical dependency	148 (27.5)	14 (3.5)	$\chi^2 = 92.04$; p < 0.001
Evaluation	41 (7.6)	136 (34.1)	$\chi^2 = 105.00$, p < 0.001
Competence	13 (2.4)	10 (2.5)	NS
Behavioral problem	20 (3.7)	8 (2.0)	NS
Agitation	10 (1.9)	63 (15.8)	$\chi^2 = 62.03$; p < 0.001
Anxiety	32 (5.9)	84 (21.1)	$\chi^2 = 18.34$; p < 0.001
Confusion, delirium	44 (8.2)	108 (27.1)	$\chi^2 = 60.34$; p < 0.001
Somatic concerns	21 (3.9)	25 (6.3)	NS
Social difficulty	12 (2.2)	40 (10.0)	$\chi^2 = 26.6$; p < 0.001

TABLE 3. Psychiatric Diagnosis, N (Percent)

	United States	Japan	Comparison Statistics
Depression	286 (54.7)	78 (19.5)	$\chi^2 = 116.94$; p < 0.001
Bipolar disorder	34 (6.6)	6 (1.5)	$\chi^2 = 13.79$; p < 0.001
Psychosis	47 (9.1)	42 (10.5)	NS
Adjustment disorder	44 (8.5)	35 (8.8)	NS
Anxiety disorder	71 (13.7)	37 (9.3)	$\chi^2 = 4.26$; p = 0.04
Somatoform disorder	16 (3.1)	7 (1.8)	NS
Alcohol-related disorder	130 (24.9)	26 (6.5)	$\chi^2 = 54.35$; p < 0.001
Drug-related disorder	71 (13.7)	0	$\chi^2 = 59.16$; p < 0.001
Delirium	100 (19.0)	87 (21.8)	NS
Dementia	24 (4.6)	25 (6.3)	NS
Personality disorder	26 (5.0)	22 (5.5)	NS
Other	12 (2.3)	3 (0.8)	NS
No psychiatric disorder	8 (1.5)	24 (6.0)	$\chi^2 = 13.33$; p < 0.001
Axis IV			
Socioeconomic	296 (58.0)	85 (21.3)	$\chi^2 = 124.09$; p < 0.001
Health-related	203 (39.8)	75 (18.8)	$\chi^2 = 46.53$; p < 0.001
GAF, mean (SD)	43.9 (14.5)	49.4 (19.9)	$t[550] = -4.30$; p < 0.001

GAF: Global Assessment of Functioning; SD: standard deviation.

that differences do exist between hospital consultations in urban Minnesota and Kanagawa, Japan. Referred patients in the former setting demonstrated more mood and anxiety disorders and chemical dependencies. One partial explanation involves prevalence rates of affective problems. Several cross-national studies have shown lower prevalence of mood and anxiety disorders among East Asian countries, including Japan, as compared with Western countries.[6–8] Moreover, 1-month prevalence of DSM–IV major depression is lower in China (2.5%) and Japan (1.6%) than in Western countries (4%–26%).[6] There is nothing extant in the research literature to suggest that this lower prevalence in East Asian countries is culturally influenced.

Influences specific to a culture are of two types: The first involves stable, prevailing views regarding ingrained values, or "what ought or ought not to be." Such values may stem from historic and religious traditions, inculcated via child-rearing. The second refers to temporary conditions related to influences of changing economic and political forces in a culture during a particular epoch of time.[9] In the United States, a core value seems to be that of individualism, such that Americans focus on explaining deviance relative to influences from group forces (peers, family, school, society). In Japan, a recognized core value is one in which more importance is placed on the collective society, as opposed to the individual. Japanese people place value on group over individual goals.[10]

Several cross-cultural surveys reveal that Japanese people experience greater shame and stigma relative to using mental health services than do people in Western countries.[11,12] Such stigmatization may be a component of an apparent core value of the Japanese culture: an emphasis on preservation of the collective even at the expense of the individual. Departures from normative expectations are attributed to the person; mental and emotional problems are a weakness for which the individual is responsible. Japanese physicians who accept such preconceptions may be reluctant to refer certain patients. This may, in particular, involve patients with symptoms of depression. In order to avoid stigmatization, nonpsychiatric physicians in Japan may attempt to treat ostensibly depressed patients on their own, without psychiatric input (see Ito et al.[13]). However, nonpsychiatric Japanese physicians may feel more "comfortable," attribute less stigmatization, or feel less competent to deal with, agitated or anxious patients, or those with delirium.

Of special note is the category related to "social issues." This was the single most frequent referral in the

Tokai University Hospital. One hypothesis is that Japanese physicians view psychiatrists as an important resource for psychosocial management concerns. This is in the context of inadequate numbers of non-physician mental health professionals serving in Japanese general hospitals. For instance, there is a shortage of social workers in such settings (0.5 per 100 beds, including non-certified individuals, in hospitals in Japan.[14]) There is also a shortage of psychiatric nurses, along with a provider system in which a psychologist is classified as "non-medical" and not qualified for hospital reimbursement.[15] Hence, there is a dearth of hospital mental health personnel who might share in providing for the psychosocial needs of patients. This would constitute a temporary, economic or political issue in Japan, not a core characteristic, and one not shared with today's American culture.

Another "social-issues" hypothesis is that the disproportionately high number of Japanese referrals in this area relates to Japan's ostensible collective/individual cultural values. In Japan, more importance is placed on the collective as opposed to the individual well-being; Japanese people place value on group over individual goals. In contrast, in the United States, there appears to be an opposing core value, in which individual deviance is attributed to external deleterious factors in the family, school, or society-at-large, thus protecting the individual, rather than the group. Thus, physicians in America might not be inclined to refer patients with social difficulties for what amount to a group, and not an individual problem. As indicated above, Japanese clinicians may be predisposed to protect the collective and assign causal influence for interpersonal difficulties to the individual. Therefore, in Japan, apparent problems in the social domain are more likely to be perceived as a function of individual maladaptation, requiring intervention directly with the disturbed person. This observed difference between American and Japanese hospitals may thus involve a core-value disparity.

Referred patients in Minneapolis were more acute and serious in manifested symptoms, with a higher incidence of past psychiatric history, suicidal proclivities, depression, and chemical dependency, and lower, more severe GAF estimates. The lower severity rates among referred patients in the Tokai University Hospital may relate to the fact that Japan has more psychiatric beds per 10,000 people than other countries of the world (for example, Japan has 28.4 psychiatric beds, versus 7.7 for America in mental hospitals, and 20.6 versus 3.1 in general hospitals).[16] Our data, therefore, may reflect the fact that, in Japan, patients with relatively low or moderate medical severity may be directly

admitted to psychiatric beds in general or mental hospitals. Again, this may constitute a temporary cultural condition in Japan, not shared with the psychiatric community in America.

There were several important similarities shared between the two hospital consultation services. Both showed a low referral rate, 2.4% to 3.1%, results similar to those of other studies.[17] Furthermore, both involved patients with longer hospital stays, as compared with non-consultation patients. Patients in both countries often obtained psychiatric consultations late in their hospital stay (i.e., on average, over 30% of hospital days passed before patients received consultation). This is unfortunate, since there are data showing that earlier consultation tends to reduce total LOS.[2,4,18,19] Our study adds emphasis to the problems encountered when psychiatric consultation relies on non-psychiatric physician referrals.

It is important to acknowledge limitations in our investigation. First, the study represents a retrospective analysis of consultation records. Standardized psychiatric scales and structured clinical interviews were not used. Second, the findings may not be applicable to patients outside university teaching hospitals. Third, since the American and Japanese hospitals were not randomly selected; the results may not generalize to cross-cultural comparisons of other teaching hospitals in the respective countries. Finally, it is important to note that in the absence of experimental or quasi-experimental controls, it cannot be definitively inferred that any consultation differences are in turn related to cross-cultural differences. It must be recognized that a comparison of consultation data between two randomly-selected university hospitals within either country might have yielded the same configuration of findings. Nevertheless, our data do suggest differences between hospitals in America and those in Japan that are consistent with known core-values or differences in contemporary cultural dynamics.

CONCLUSIONS

In comparing consultation–liaison services in the two hospitals, differences, as well as similarities emerged; some of the differences may reflect indigenous values or current cultural conditions in the separate cultures in which the hospitals are embedded. Such values and conditions may affect the nature of physician referrals and psychiatric diagnoses, albeit other interpretations are possible. Nonetheless, the differences found in the current investigation exemplify the importance of tailoring psychiatric training and implementation of psychiatric consultation that conflate with the nature of patient referrals (e.g., more chemical-dependency management in Minnesota; more psychosocial problems in the Japanese hospital), case complexity, and the specific type of existing healthcare system. The INTER-MED procedures developed by Huyse and colleagues constitute an exemplar of such an integrated approach.[20,21]

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General
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Delirium: patient characteristics that predict a missed diagnosis at psychiatric consultation

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Abstract

Objective: This study evaluates patient characteristics that might predict a missed diagnosis of delirium prior to being seen by a psychiatric consultant.
Method: Study participants were assessed using quantitative standardized scales of cognitive function, delirium and physical impairment.
Results: Referring service personnel missed the diagnosis of delirium in 46% of psychiatric consultations. Two factors were associated with their failure to identify delirium accurately: use of a past psychiatric diagnosis to explain delirium symptoms and the presence of pain. Symptoms of delirium and quantitative scale scores did not distinguish between patients with whom diagnosis had been missed and those with accurate diagnoses.
Conclusion: The consulting physicians of patients with delirium often incorrectly turn to past psychiatric diagnoses and/or are distracted by the presence of pain and, thus, fail to accurately diagnose delirium.
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Keywords: Delirium; Missed diagnosis; Psychiatric consultation; Past psychiatric diagnosis; Pain; Diagnostic errors

1. Introduction

Delirium is a common mental disorder in medical and surgical inpatients. It is associated with higher mortality rates, longer lengths of hospital stay, poor functional recovery and increased likelihood of nursing home placement [1–6]. Delirium is a psychiatric manifestation of an underlying medical illness. The importance of the rapid recognition and treatment of delirium cannot be overstated.

A prompt search for its underlying cause is one of the most important aspects in the management of delirium. Consulting psychiatrists, however, find that medical and surgical doctors often mistake delirium for other psychiatric illnesses such as depression or anxiety. This delays the diagnosis and treatment of delirium, and contributes to an exacerbation of the medical illness causing the symptoms. It also complicates the medical and nursing care provided by staff, who are typically untrained to deal with agitated and often combative behaviors in a medical or surgical ward setting.

The purpose of this study was to examine the factors, including patients' characteristics and symptoms of delirium, associated with a missed diagnosis of delirium by medical and surgical staff.

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2. Method

This study investigated patients given a diagnosis of delirium by the psychiatric consultation team at Tokai University Hospital in Japan. Only patients who were diagnosed as having delirium, as assessed independently by two fully trained consultation psychiatrists (Y.K., M.K., or T.O.). were included. After providing informed consent, study participants were given the Mini-Mental State Examination (MMSE; a tool that had been validated with eight Japanese subjects) [7] to measure cognitive functions. MMSE scores range from 0 to 30, with a score of ≤23 indicating significant cognitive impairment. Participants were also administered the Delirium Rating Scale — Revised 98 (DRS-R-98), a 13-item interviewer-rated scale used to measure symptoms of delirium [8]. The sum of the 13 item scores rated from 0 to 3 provides a severity score ranging from 0 to 39, with higher scores indicating a greater severity of delirium. The DRS-R-98 has three additional items (rated from 0 to 3), which are used to differentiate delirium from other psychiatric disorders. The total scores of the DRS-R-98, therefore, may range from 0 to 48. The DRS-R-98 had been also validated with Japanese participants [9].

Patient performance status was assessed using the Eastern Cooperative Oncology Group Performance Status (ECOG PS) [10]. ECOG PS scores range from 0 to 5, with higher scores indicating greater difficulties with activities of daily living. The overall severity of illness was also assessed using the Clinical Global Impression (CGI) scale [11]. The CGI scale is scored as a single overall impression of illness severity on a Likert-type scale ranging from 1 to 7. The presence of pain was recorded as present or absent based on direct interviews of patients and information from ward staff or family members.

Consultation requests were carefully reviewed. A correct diagnosis of delirium by a referring consultee was recorded if a referral letter included the word "delirium" or the phrase "rule out delirium." Acceptable synonyms for delirium included "acute confusional state," "mental status changes," "intensive care unit syndrome" and "encephalopathy."

The following information was also recorded for each consultation: patient demographics, date of admission, date of consultation and the specialty service requesting the consultation. Specialty services requesting consultations were divided into medicine and surgery. Medicine included internal medicine, cardiology, neurology and general medicine. Surgery included general surgery, cardiac–thoracic surgery, neurosurgery, orthopedic surgery and otolaryngology.

This study was approved by the Institutional Review Board of Tokai University.

3. Statistical analysis

For comparisons of parametric data in two groups, appropriate two-sample *t* tests were performed based on equal or unequal variances by Levene's test. Chi-square test was used to compare categorical data. When sample sizes were prohibitively small, we used Fisher's Exact Test.

4. Results

Of 48 patients who received a final psychiatric diagnosis of delirium, 26 (54%) were correctly diagnosed prior to referral. In 22 instances, the diagnosis had been missed. Among those with a diagnosis inconsistent with delirium, five were considered depressed, and five were anxious. Four were noted to have suicidal proclivities, and four others had unexplained somatic complaints. In six patients, the request was psychiatric evaluation or assessment of an unspecific mental condition. Other reasons for referral were a history of chemical dependence (n=5) and failure to adhere to medical advice (n=1). The most frequent primary underlying physical conditions were cancer [n=18 (82%) in the missed-diagnosis group and n=16 (62%) in the correctly diagnosed group]. There was no statistical difference in the frequency of cancer diagnosis between the groups. Twenty-three referrals came from medicine, and 25 referrals came from surgery. There was no difference in the frequency of missed diagnoses between referring service personnel.

Table 1 shows patient characteristics. The missed-diagnosis group had a higher frequency of past psychiatric

Table 1
Background characteristics

	Missed group (n=22)	Correct group (n=26)	
Age in years [mean (S.D.)]	71.4 (11.7)	66.1 (15.5)	t=1.31, df=46, P=.195
Gender: male [n (%)]	16 (72.2)	19 (73.1)	χ^2=0.001, P=.98
Education in years [mean (S.D.)]	11.4 (3.4)	12.3 (2.6)	t=−1.048, df=42, P=.301
Marital status: married [n (%)]	14 (63.6)	20 (76.9)	χ^2=1.02, P=.313
Living situation: living alone [n (%)]	5 (22.7)	4 (15.4)	P=.713 (Fisher's Exact Test)
Employment status: employed [n (%)]	6 (27.3)	8 (30.8)	χ^2=0.07, P=.791
Past psychiatric history: positive [n (%)]	9 (40.9)	4 (15.4)	χ^2=3.93, P=.047
Pain: positive [n (%)]	14 (63.6)	9 (34.6)	χ^2=4.02, P=.045
Days between admission and consultation [mean (S.D.)]	19.5 (21.5)	23.8 (33.8)	t=−0.51, df=46, P=.609
ECOG PS score [mean (S.D.)]	2.9 (1.0)	2.8 (1.2)	t=−0.29, df=46, P=.775
MMSE total score [mean (S.D.)]	15.0 (8.4)	17.1 (5.7)	t=−1.10, df=46, P=.295
DRS-R-98 severity score [mean (S.D.)]	19.6 (7.2)	20.5 (6.3)	t=−0.47, df=46, P=.643
DRS-R-98 total score [mean (S.D.)]	24.3 (6.9)	25.0 (6.7)	t=−0.35, df=46, P=.729
CGI scale scores [mean (S.D.)]	5.4 (0.8)	5.5 (0.7)	t=−0.78, df=46, P=.440

illness and was found to have extant pain. There were no differences in other variables. Of note, there were no differences in symptoms of delirium on the DRS-R-98 between the two groups.

5. Discussion

This study suggests that medical and surgical specialists fail to correctly diagnose delirium in almost half of all cases referred for psychiatric consultation. This rate is consistent with the study of Armstrong et al. [12], who reported a similar percentage (46%) in a Veterans Affairs setting. At a university teaching hospital setting in the United States, 63% of patients with delirium were incorrectly diagnosed by the referring service personnel [13].

It has long been suggested that a hypoactive–hypoalert form of delirium is frequently misdiagnosed as depression, which underscores the importance of considering delirium in the differential diagnosis of patients' mood disturbance [14–18]. However, delirious symptoms (including psychomotor retardation, language disturbance and attention deficits) and quantitative scale scores (on the DRS-R-98, MMSE, ECOG PS and CGI scale) could not distinguish between those with missed diagnoses and those in the correctly labeled group. In this study, two factors were associated with unrecognized delirium by consultees: past psychiatric history and the presence of pain. This may indicate that past psychiatric history unduly influences diagnostic considerations; moreover, the presence of pain may confound the accurate identification of delirious symptoms in medical and surgical patients. This finding is consistent with other studies indicating that psychiatric history affects medical doctors' clinical decision making, such as the estimation of disease presence and willingness to order tests or clinical procedures [19,20]. It is necessary to be cognizant of this potential bias when assessing for delirium in general hospital patients who show behavioral problems.

It is important to acknowledge the methodological limitations of the study. First, since this study represents patients of clinicians involved in typical psychiatric consultations in one university hospital, the findings in this study may not be applicable to all patients referred for consultation psychiatry services in Japan or other countries. Furthermore, the diagnosis of delirium by consultants was based on Diagnostic and Statistical Manual of Mental Disorders, Fourth Edition, Text Revision criteria, not on a diagnostic scale, even though the DRS-R-98 (severity scale) was administered. Despite this, the rate of misdiagnosis found in this study is consistent with the rates of other studies conducted outside Japan. Second, the subjects of the study likely represented a biased subset of patients with delirium — those who might be difficult cases for typical medical and surgical doctors. Third, the severity of delirium may also affect our results, since both groups were on the midrange of DRS-R-98 scores. Fourth,

we did not assess underlying dementia, which might influence medical and surgical doctors' identification of delirium. It would likely be worthwhile to undertake further research to evaluate the influence of underlying dementia on the identification of delirium in medical settings. Finally, this study mainly assessed patient factors. Future research of this type should evaluate the characteristics of referring physicians that might influence diagnostic accuracy.

In summary, it is important to identify the factors associated with missed diagnoses in patients with delirium who are treated in medical units. Factors such as overweighting of past psychiatric diagnoses and distraction of extant pain appear to contribute to diagnostic inaccuracies regarding the presence of delirium. Furthermore, we need to go beyond improving the ability of referral service personnel to correctly detect delirium by implementing earlier curricular changes in the education of medical and surgical doctors. In the management of delirium, recent studies show that delirium prevention in high-risk patients (i.e., multi-disciplinary delirium prevention programs) leads to improved outcomes when compared to intervening after delirium had developed [21–23]. Proactive case finding has also been shown to be cost-effective [24]. New efficient and effective proactive approaches should be incorporated in order to improve overall delirium treatment in the future, rather than relying on the current reactive psychiatric consultation system.

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