The relation between anxiety and depressive symptoms in normal subjects and patients with anxiety and/or mood disorders

Yasuhiro Kaneda, and Akira Fujii

Department of Neuropsychiatry, Fujii Hospital, Anan, Tokushima, Japan

Abstract : Objective : We investigated the associations between anxiety and depressive symptoms in normal subjects and patients with mood and/or anxiety disorders, using the Japaneses version of Spielberger's STAI and the Zung SDS. Methods : The subjects for the present study were 60 normal subjects, 15 patients with anxiety disorders and, 12 patients with mood disorders meeting the DSM-IV diagnostic criteria. Informed consent was obtained from all subjects. Results : 1) Both the mean total state-anxiety (S-anxiety) and trait-anxiety (T-anxiety) scores were significantly higher in patients with anxiety disorders and mood disorders than in normal subjects. 2) The mean total SDS score was significantly higher in patients with anxiety disorders and mood disorders than in normal subjects. 3) In normal subjects, there were significant positive correlations between the total T- and S-anxiety scores and total SDS scores. 4) In patients with anxiety disorders, there were significant positive correlations between the total T- and S-anxiety scores and total SDS scores. 5) In patients with mood disorders, there were nonsignificant positive correlations between the total T- and S-anxiety scores and total SDS scores. Conclusion : Our results might provide support for the existence of common underlying mechanisms to anxiety and depression. J. Med. Invest. 47 : 14-18, 2000

INTRODUCTION

Comorbid psychiatric disorders have been attracting attention, since they may exert significant influence on what is presumed to be the major or underlying psychiatric disorder (1-3). Anxiety symptoms, as well as depressive symptoms, are not uncommon in psychiatric disorders. Moreover, anxiety and depressive symptoms commonly co-occur (1), though the underlying mechanisms for this covariation remain poorly understood. In previous reports, measures assessing anxiety and depressive levels showed strong correlations between them in a nonclinical sample (4), and a clinical sample (5). However, in these studies, depression and anxiety were not clearly differentiated. The aim of this study is to investigate the level of anxiety and depressive symptoms and the associations between them in normal subjects and patients with mood and/or anxiety disorders, using the Japanese version (6) of Spielberger's State-Trait Anxiety Inventory (STAI) (7) and the Zung Self-Rating Depression Scale (SDS) (8).

METHODS

The subjects for the present study were 60 normal subjects (35 females and 25 males), 15 patients (6 females and 9 males) with anxiety disorders and, 12 patients (11 females and a male) with mood disorders meeting the DSM (Diagnostic and Statistical Manual of the American Psychiatric Association)-IV (9) diagnostic criteria (Appendix 1). None of the patients with anxiety disorders meets the current defi-

nitional threshold for DSM-IV axis I mood disorders, and none of the patients with mood disorders meets that for anxiety disorders. Informed consent was obtained from all subjects for the research involved in this study. Normal subjects and patients with anxiety or mood disorders had respective ages of 40.3± 10.3 years, 42.0± 14.3 years and 45.3± 16.8 years (Table 1).

Psychiatric ratings were done using the Japanese version (6) of the STAI (7) and the Japanese version (10) of the SDS (8). The STAI is composed of two separate 20-item scales constructed to measure " state" and " trait" anxiety, using 4-point scales. On the State Scale, the respondent is asked to indicate" how [he/she] feels right now, that is, at this moment" with respect to each of 20 different items. On the Trait Scale, the respondent is asked to indicate " how [he/she] generally feels" with respect to each of 20 different items. Scores correlate with expected results under stressful and nonstressful experimental conditions and discriminated neuropsychiatric patients from community residents. The STAI scores were calculated for the complete 40-item measure. The SDS is composed of 20-item scales constructed to measure depressive symptoms, using 4-point scales. The SDS was devised to quantitate the symptoms of depression, and scores correlate with clinical evaluation of patients for the presence of depressive disorders. The SDS scores were calculated for the complete 20-item measure.

Statistical analyses were done using nonparametric tests (Mann Whitney's U-test, Spearman's rank correlation) because of small samples.

RESULTS

1. Anxiety

In normal subjects, patients with anxiety disorders and patients with mood disorders, total state-anxiety (S-anxiety) scores were 41.6± 8.6, 51.0± 11.6 and 53.8± 12.5, respectively, while, total trait-anxiety (T-anxiety) scores were 42.5± 8.7, 52.9± 15.1 and 58.7± 11.3 (Table 1). Both the mean total S-anxiety and T-anxiety scores were significantly higher in patients with anxiety disorders and mood disorders than in normal subjects (U-test, p<.01), while there was no significant difference between patient groups.

2. Depressive symptoms

In normal subjects, patients with anxiety disorders

Table 1. Demographic characteristics of subjects

	N	Age (yr) Mean± SD	Total state-anxiety scores Mean± SD	Total trait-anxiety scores Mean± SD	Total SDS scores Mean± SD
Normals	60	40.3± 10.3	41.6± 8.6	42.5± 8.7	34.4± 9.3
Anxiety disorders	15	42.0± 14.3	51.0± 11.6**	52.9± 15.1**	48.3± 13.5**
Mood disorders	12	45.3± 16.8	53.8± 12.5**	58.7± 11.3**	48.9± 9.2**

SDS = the Zung Self-Rating Depression Scale.
**p<.01 versus normals by Mann Whitney's U-test.

Table 2. Correlations between depressive and anxiety symptoms

		ρ	p values
Normals	State-anxiety	.362	p<.05
	Trait-anxiety	.621	p<.01
Anxiety disorders	State-anxiety	.611	p<.05
	Trait-anxiety	.775	p<.01
Mood disorders	State-anxiety	.413	NS
	Trait-anxiety	.529	NS

ρ   coefficients by Spearman rank correlations

and mood disorders, total SDS scores were 34.4± 9.3, 48.3± 13.5 and 48.9± 9.2, respectively (Table 1). The mean total SDS score was significantly higher in patients with anxiety disorders and mood disorders than normal subjects (U-test, p<.01), while there was no significant difference between the patient groups.

3. Relationship between anxiety and depressive symptoms

3-1. Relationship between anxiety and depressive symptoms in normal subjects

The relations between anxiety and depressive symptoms in normal subjects are shown in Table 2. In normal subjects, there were positive correlations between the total T- and S-anxiety scores and total SDS scores (T-anxiety and SDS : Spearman's ρ=.621, p<.01, N=60 ; T-anxiety and S-anxiety : ρ=.727, p<.01, S-anxiety and SDS : ρ=.362, p<.05).

3-2. Relationship between anxiety and depressive symptoms in patients with anxiety disorders

Table 2 shows the relationship between the total T- and S-anxiety scores and total SDS scores in patients with anxiety disorders. In patients with anxiety disorders, there were positive correlations between the total T- and S-anxiety scores and total SDS scores (T-anxiety and SDS : Spearman's ρ=.775, p<.01, N=15 ; T-anxiety and S-anxiety : ρ=.696, p<.01, S-anxiety and SDS : ρ=.611, p<.05).

3-3. Relationship between anxiety and depressive symptoms in patients with mood disorders

Table 2 also shows the relationship between the total T- and S-anxiety scores and total SDS scores in patients with mood disorders. In patients with mood disorders, there were positive correlations between the total T- and S-anxiety scores and total SDS scores (T-anxiety and SDS : Spearman's ρ=.529, NS, N=12 ; T-anxiety and S-anxiety : ρ=.839, P<.01, S-anxiety and SDS : ρ=.413, NS).

DISCUSSION

In the present study, there were significant positive correlations between the total T- and S-anxiety scores and total SDS scores in normal subjects and patients with anxiety disorders, and in patients with mood disorders, the total T- and S-anxiety scores were nonsignificantly and positively correlated with

the total SDS scores. The results of our findings are consistent with the previous reports of Dobson (4) and Mendels *et al.* (5). Moreover, the SDS scores were more clearly associated with T-anxiety versus S-anxiety scores. These findings are surprising, since anxiety and depression seem to be phenomenologically distinct experiences. However, the high correlations between anxiety and depression provide support for the existence of common underlying mechanisms, although further research with more samples is required. Meanwhile, our findings may explain the difficulty of differentiating anxiety and depression in clinical practice (11).

So far, the therapeutic success of conventional antidepressants [e.g., tricyclic antidepressants (12)] and newer antidepressants [e.g., selective serotonin (5-HT) reuptake inhibitor (13)] in anxiety disorders has suggested the existence of common underlying mechanisms to anxiety and depression. Anxiety (14) and depression (15) involve a dysregulation in the function of several transmitters including 5-HT and noradrenaline. And, the evidence from pharmacological studies that 5-HTergic medications are effective in alleviating both anxiety and depression is indicative of 5-HTergic dysregulation as a common mechanism underlying anxiety and depression. Further, investigations conducted with child and adolescent samples (16) suggest that anxiety sensitivity is positively related to depression. In addition, the results of Thapar, *et al.* (17) suggest that most of the covariation of maternally rated anxiety and depressive symptoms can be explained by a common set of genes that influence anxiety and depressive symptoms.

It is not yet clear what determines the difference between anxiety and depressive symptoms. However, in treating depression, 5-HTergic medications are as effective as noradrenergic drugs, and in anxiety, both 5-HTergic and noradrenergic drugs are effective although the 5-HTergic medication is somewhat more potent (18). Therefore, these different responses may highlight the differences between anxiety and depression.

Lastly, we must point out the possibility that the two self-rating measurements used in this study, the STAI and SDS, might share common components as noted by Feldman (19), though Nelson and Novy have reported that with the STAI and another self-rating depression scale, the Beck Depression Inventory (20), it is possible to distinguish different dimensions of anxiety and depression (21). For a clearer determination of the relation between anxiety and

depression, we might need more specific tools of assessment.

CONCLUSIONS

T- and S-anxiety levels are highly correlated with the level of depression. Our results might provide support for the existence of t common underlying mechanisms to anxiety and depression.

ACKNOWLEDGMENTS

REFERENCES

1. Brown C, Schulberg HC, Madonia MJ, Shear MK, Houck PR : Treatment outcomes for primary care patients with major depression and lifetime anxiety disorders. Am J Psychiatry 153 : 1293-1300, 1996

2. Coryell W, Zimmerman M : Diagnosis and outcome in schizo-affective depression : a replication. J Affect Disord 15 : 21-27, 1988

3. Lesser IM, Rubin RT, Pecknold JC, Rifkin A, Swinson RP, Lydiard RB, Burrows GD, Noyes RJ, DuPont RLJ : Secondary depression in panic disorder and agoraphobia. I. Frequency, severity, and response to treatment. Arch Gen Psychiatry 45 : 437-443, 1988

4. Dobson KS : An analysis of anxiety and depression scales. J Pers Assess 49 : 522-527, 1985

5. Mendels J, Weinstein N, Cochrane C : The relationship between depression and anxiety. Arch Gen Psychiatry 27 : 649-653, 1972

6. Nakazato K, Mizuguchi T : Development and validation of Japanese version of State-Trait Anxiety Inventory : a study with female subjects. Shinshin Igaku (Japanese Journal of Psychosomatic Medicine) 22 : 107-112, 1982 (in Japanese)

7. Spielberger CD, Gorsuch RL, Lushene RE : STAI manual. Consulting Psychologist Press, Palo Alto, 1970

8. Zung WW, Durham NC : A self-rating depression scale. Arch Gen Psychiatry 12 : 63-70, 1965

9. American Psychiatric Association : Diagnostic and Statistical Manual of Mental Disorders, Fourth Edition (DSM-IV). American Psychiatric Association, Washington, D.C., 1994

10. Fukuda K, Kobayashi S : A study on a self-rating depression scale. Seishin Shinkeigaku Zasshi (Psychiatria et Neurologia Japonica) 75 : 673-679, 1973 (in Japanese)

11. Stavrakaki C, Vargo B : The relationship of anxiety and depression : a review of the literature. Br J Psychiatry 149 : 7-16, 1986

12. Klein D, Fink M : Psychiatric reaction patterns to imipramine. Am J Psychiatry 119 : 432-438, 1962

13. Sheehan DV, Harnett-Sheehan K : The role of SSRIs in panic disorder. J Clin Psychiatry 57 (Suppl. 10) : 51-58, 1996

14. Salzman C, Miyawaki EK, Le Bars P, Kerrihard TN : Neurobiologic basis of anxiety and its treat-ment. Harv Rev Psychiatry 1 : 197-206, 1993

15. Syvälahti EK : Biological aspects of depression. Acta Psychiatr Scand (Suppl. 377) : 11-15, 1994

16. Weems CF, Hammond-Laurence K, Silverman WK, Ferguson C : The relation between anxiety sensitivity and depression in children and adolescents referred for anxiety. Behav Res Ther 35 : 961-966, 1997

17. Thapar A, McGuffin P : Anxiety and depressive symptoms in childhood- -a genetic study of comorbidity. J Child Psychol Psychiatry 38 : 651-656, 1997

18. Johnson MR, Lydiard RB, Ballenger JC : Panic disorder. Pathophysiology and drug treatment. Drugs 49 : 328-344, 1995

19. Feldman LA : Distinguishing depression and anxiety in self-report : evidence from confirmatory factor analysis on nonclinical and clinical samples. J Consult Clin Psychol 61 : 631-638, 1993

20. Beck AT, Ward CH, Mendelson M, Erbaugh J : An inventory for measuring depression. Arch Gen Psychiatry 4 : 561-571, 1961

21. Nelson DV, Novy DM : Self-report differentiation of anxiety and depression in chronic pain. J Pers Assess 69 : 392-407, 1997

APPENDIX 1.

A. *Mood disorders (Major depressive disorder)*

Five or more symptoms present for at least two weeks, with a significant impairment in occupational or social functioning ; at least (1) or (2) presents.

(1) Abnormal depressed mood (or irritable mood if a child or adolescent) most of the day, nearly every day.

(2) Abnormal loss of all interest and pleasure most of the day, nearly every day.

(3) Appetite or weight disturbance, either : Abnormal weight loss (when not dieting) or weight gain, or abnormal decrease or increase in appetite nearly every day.

(4) Sleep disturbance, either abnormal insomnia or abnormal hypersomnia nearly every day.

(5) Activity disturbance, either abnormal agitation or abnormal slowing (observable by others) nearly every day.

(6) Abnormal fatigue or loss of energy nearly every day.

(7) Abnormal self-reproach or inappropriate guilt nearly every day.

(8) Abnormal poor concentration or indecisiveness nearly every day.

(9) Abnormal morbid thoughts of death (not just fear of dying) or suicide.

B. *Anxiety disorders (Generalized anxiety disorder)*

Generalized anxiety disorder is excessive anxiety and worry, occurring most days for more than six months. It refers to excessive anxiety in a range of situations that does not fit into any of the more common syndromes. The anxiety and worry are associated with three (or more) of the following six symptoms.

(1) restlessness or feeling keyed up or on edge

(2) being easily fatigued

(3) difficulty concentrating or mind going blank

(4) irritability

(5) muscle tension

(6) sleep disturbance (difficulty falling or staying asleep, or restless unsatisfying sleep)