Psychological Characteristics in Patients during Treatment for Tobacco Dependence

Akiko Matsuda,* Junichi Hasegawa,† Xinhui Wang,† Satoshi Tsuno† and Norimasa Miura†

*Department of Fundamental Nursing, School of Health Science, Tottori University Faculty of Medicine, Yonago 683-8503, Japan and †Division of Pharmacotherapeutics, Department of Pathophysiological and Therapeutic Science, School of Medicine, Tottori University Faculty of Medicine, Yonago 683-8503, Japan

ABSTRACT

Background   Few studies compare mood in tobacco cessation patients with mood in continuing smokers and then estimate the effects of a tobacco cessation program according to status of mood. We investigated whether mood in patients ($n = 7$) dependent on tobacco improved through the standard Japanese 12-week program for smoking cessation comparing smokers ($n = 11$) and nonsmokers ($n = 16$).

Methods   A brief Japanese version of the short profile of mood states (POMS) was used in this study. The subscale includes 5 negative mood factors (tension-anxiety, depression, anger-hostility, fatigue and confusion-bewilderment) and positive mood factors (vigor-activity). We also examined expiratory CO concentration (ppm), percentage of COHb, urinary nicotine and its metabolite concentration, Brinkman index, and tobacco dependence score (TDS) for both smoking cessation group and smokers group.

Results   All the short profiles for mood state points in nonsmokers were below 50. Two of TDS items in smoking cessation patients were significantly higher in percentage than those in smokers. Brinkman indices and expiratory CO concentration were significantly higher in smoking cessation patients than those in smokers. The rate of improvement in tension-anxiety points in smoking cessation patients was significantly higher than that in smokers.

Conclusion   Counseling according to the standard program in the treatment of tobacco dependence may be an effective procedure to improve mood status.

Key words   tobacco dependence; smoking cessation; smoker; psychological characteristic; mood states

It is known that tobacco/nicotine dependence causes cognitive, behavioral, and physiological symptoms, and smoking cessation affects mood in smoking patients.[1, 2] The status of mood was reported to be worse in smokers than in nonsmokers.[3] Many studies showed the moderate effects of smoking cessation treatment programs on physiological function; however, few studies compare mood in smoking cessation patients and that in smokers and estimate the effects of the program on the status of mood. We investigated whether mood in patients with tobacco dependence improved through the Japanese 12-week standard program for smoking cessation comparing smokers and nonsmokers.

SUBJECTS AND METHODS

Participants for this study were recruited through information on posters at Tottori University hospital and campus. Thirty-four male volunteers aged 25–70 were enrolled in this study from March to September in 2011. Written informed consent for this study was obtained from all participants. Inpatients and patients with cancer and allergic diseases were excluded. The subjects were smoking cessation patients ($n = 7$), smokers ($n = 11$) and nonsmokers ($n = 16$).

The age, presence of complications, smoking status of family members, occupation, smoking environment, and mood states at work were examined. Mood states of patients were estimated by questionnaire in a brief Japanese version of the short profile of mood states (POMS)[4] at base line and end point. It contains 30 items based on a 5-point scale from 0 (not at all) to 4 (extremely). The subscale includes 5 negative mood factors (tension-anxiety, depression, anger-hostility, fatigue, and confusion-bewilderment) and positive mood factors (vigor-activity). We examined expiratory CO concentration, percentage of COHb, urinary nicotine and its metabolite concentration (NicCheck I Mossman Associates, MA, USA) expressed by 0-14 degrees, Brinkman index, and tobacco dependence score (TDS)[5] of both the smoking cessation group and smokers group at base line. Smokers were defined as participants who currently smoked more than 10 cigarettes per day. Smoking cessation patients were defined by the 4 conditions below: i) smoking every day up to examination (high COHb); ii) diagnosis of tobacco

dependence syndrome (TDS: more than 5); iii) a high Brinkman index (more than 200) and iv) having the intention to quit smoking.

Smoking cessation patients were treated by the standard Japanese program for treatment of tobacco dependence for 12 weeks, while the smokers were just observed without treatment.[6] Patients received the appropriate advice for the problem of smoking cessation.

Statistical analysis

The continuous variables on baseline were compared between the 3 groups by analysis of variance. The continuous variables before and after the observation were examined by Wilcoxon's signed-rank test (two-side).

The decrease from the baseline to the end point in each POMS points is defined as "improvement", and its increase is defined as "aggravation". The rate was compared between smoking cessation patients and smokers by Pearson's product moment correlation. $P < 0.05$ was considered statistically significant. Analysis was performed by SPSS/Ver. 11.0J for Windows (SPSS Japan, Tokyo, Japan).

The Ethics Committee of Tottori University Faculty of Medicine approved the study protocol.

RESULTS

Characteristics of patients were indicated in Table 1. Mean of age in smoking cessation patients was significantly higher than that in smokers. Oral varenicline ($n = 6$) or nicotine patch ($n = 1$) were used as smoking cessation medications. There were no significant differences in POMS points among the three groups at the base line (Table 2). All POMS points in nonsmokers were below 50. Two of TDS items in smoking cessation patients were significantly higher in percentage than those in smokers. Smoking cessation patients felt much more difficulty in quitting smoking and had some serious illness (Table 3). Brinkman indices and expiratory CO concentration were significantly higher in smoking cessation patients than those in smokers (Table 4).

There were no significant differences in POMS points among the three groups between the base line and the endpoint. In subscales of POMS, depression–dejection points in smoking cessation patients tended to decrease in the base line to the endpoint ($P = 0.095$; Table 2). The rate of improvement (reduction) on tension-anxiety points in smoking cessation patients was significantly higher than that in smokers (Table 5).

Table 1. Characteristics in subjects

	Smoking cessation patients [$n = 7$]	Smokers [$n = 11$]	Non-smokers [$n = 16$]
Age (mean ± SD)	58.6 ± 11.9	42.5 ± 11.9	42.6 ± 10.6
Past history (%)	4 (57.1)	1 (5.6)	1 (6.3)
Complication	1 (14.3)	2 (11.1)	3 (18.8)
Smoker in family member	4 (57.1)	10 (55.6)	14 (87.5)

Data are expressed in number of patients, except for age.

Table 2. Change of POMS point on the 3 groups

	Smoking cessation patients [$n = 7$]		Smokers [$n = 11$]		Non-smokers [$n = 16$]	
	Base line	Endpoint	Base line	Endpoint	Base line	Endpoint
Tension-anxiety	51.7 ±10.1	48.0 ± 6.8	50.2 ±12.3	52.4 ±10.9	48.8 ± 8.9	49.5 ±11.1
Depression-dejection	50.7 ±11.2	48.8 ± 9.2	50.6 ±10.7	54.0 ±13.5	47.7 ± 7.5	47.7 ± 7.1
Anger-hostility	52.3 ±10.8	51.1 ±10.8	49.9 ±10.0	50.8 ± 7.6	47.2 ± 7.3	48.8 ±11.9
Vigor-activity	53.7 ±11.2	51.2 ± 5.2	50.2 ± 8.7	49.9 ± 9.1	49.0 ±10.4	50.6 ±12.1
Fatigue	46.4 ± 5.2	44.7 ± 5.7	53.8 ±12.6	52.1 ±11.2	47.8 ± 8.3	51.3 ±10.5
Confusion	53.0 ± 9.2	50.7 ± 9.4	52.2 ±11.1	52.2 ± 8.1	46.5 ± 9.2	49.0 ±11.4

Data are expressed in mean ± SD. POMS, short profile of mood states.

Table 3. TDS in smoking cessation patients and smokers

	Smoking cessation patients [n = 7]		Smokers [n = 11]	
	n (%)		n (%)	
1. Smoking more than he/she intended to	6 (85.7)		4 (36.4)	
2. Unsuccessful effort to quit smoking	7 (100)		5 (45.5)	*
3. Craving for tobacco	6 (85.7)		7 (63.6)	
4. Withdrawal symptoms	5 (71.4)		6 (54.5)	
5. Smoking to avoid withdrawal symptoms	5 (71.4)		6 (54.5)	
6. Smoking despite a serious illness	5 (71.5)		2 (18.2)	*
7. Smoking despite health problems	6 (85.7)		11 (100)	
8. Smoking despite mental problems	6 (85.7)		8 (72.7)	
9. Feeling dependent on tobacco	6 (85.9)		8 (72.7)	
10. Giving up important activities to smoke	2 (28.6)		2 (18.2)	
High score (≥ 5) patients	7 (100)		6 (54.5)	
TDS (mean ± SD)	7.71 ± 3.0		5.18 ± 2.6	

*$P < 0.05$. TDS, tobacco dependence score.

Table 4. Smoking characteristics in smoking cessation patients and smokers

	Smoking cessation patients [n = 7]	Smokers [n = 11]	
Expiratory CO (ppm)	25.71 ± 16.4	10.27 ± 10.1	*
COHb (%)	3.31 ± 0.5	2.06 ± 1.8	
Urinary nicotine and metabolites	4.42 ± 2.0	5.09 ± 3.3	
Brinkman index	913.57 ± 448.7	282.18 ± 238.9	*

Data are expressed in mean ± SD. *$P < 0.05$.
Urinary nicotine and metabolites, urinary nicotine and its metabolite concentration (NicCheck I, Mossman Associates, MA), this concentration expressed by 0–14 degrees.

Table 5. Rate of improvement in POMS

	Smoking cessation patients [n = 7]		Smokers [n = 11]		
	Improvement	Aggravation	Improvement	Aggravation	
	n (%)	n (%)	n (%)	n (%)	
Tension-anxiety	7 (100)	0 (0)	6 (54.5)	5 (45.5)	*
Depression-dejection	5 (71.4)	2 (28.6)	4 (36.4)	7 (63.6)	
Anger-hostility	3 (42.9)	4 (57.1)	5 (45.5)	6 (54.5)	
Vigor-activity	4 (57.1)	3 (42.9)	6 (54.5)	5 (45.5)	
Fatigue	5 (71.4)	2 (28.6)	8 (72.7)	3 (27.3)	
Confusion	3 (42.9)	4 (57.1)	7 (63.6)	4 (36.4)	

*$P < 0.05$. Aggravation, the increase from the baseline to the end point in each POMS points; Improvement, the decrease from the baseline to the end point in each POMS points. POMS, short profile of mood states.

DISCUSSION

In this study, mean points of 5 subscales in POMS in smoking cessation patients and smokers at baseline tended to be higher than that of nonsmokers. As this point going up over the standard point of 50, the status is considered to be serious.[7] So we suspect that the status of mood in smoking cessation patients and smokers at baseline is more serious than that of nonsmokers. Therefore, in considering mood status, proper advice from medical staff is required for smoking cessation.

Smoking induces both mental and physical dependence. Therefore restriction of smoking causes withdrawal symptoms and a strong desire to smoke.[8, 9] Brinkman indices and expiratory CO concentration were significantly

higher in smoking cessation patients than in smokers. TDS points for smoking cessation patients tended to be higher than in those for smokers. On the other hand, smokers felt less difficulty in quitting smoking and stronger withdrawal symptoms than in smoking cessation patients. This may be caused by a lack of a true intention to quit. Brown et al.[10] suggested that it is necessary for medical staff to support patients with anxiety from withdrawal symptoms. The present study also suggests that it is important for us to support patients with strong withdrawal symptoms and feelings of difficulty in smoking cessation.

Changes of mood in smoking cessation patients and smokers were investigated in this study. The rate of improvement on tension-anxiety points in smoking cessation patients was significantly higher than that of smokers. The rate of improvement on depression-dejection in smoking cessation patients tended to be higher than that of smokers. It has been reported that smoking cessation may cause symptoms of depression[11] and the rate of the appearance of anxiety symptoms in ex-smokers (short-term) is higher than those in smokers.[12] It has been reported that a high recurrence rate of depression occurs in patients who have a past history of depression after quitting smoking.[13] Considering changes of mood, advice based on the standard smoking cessation treatment program for patients may be effective in improving mood status. Counseling in the treatment of tobacco dependence may be an effective tool in prevention of a depressive mood during smoking cessation. It is necessary to consider a method of psychological support for smoking cessation patients.

In the present study, the number of subjects was too small to be able to match for age and sex in order to exactly assess the association between the effect of smoking cessation treatment and the improvement of depression and anxiety. Our results may have some limitations. In conclusion, counseling according to the standard program in treatment of tobacco dependence may be effective procedure to improve the mood status.

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