

Table 5 Risk ratio of predictors for Kampo use

Demographic/clinical characteristics	Univariate			Multivariate		
	Risk ratio	95% CI	P	Risk ratio	95% CI	P
Age	1.06	0.88–1.28	0.520			
Time from diagnosis to screening	1.01	0.89–1.14	0.910			
Cancer site						
Cervix	0.90	0.56–1.46	0.677			
Corpus	0.84	0.54–1.32	0.460			
Ovary	1.41	0.93–2.14	0.103			
Other	0.72	0.34–1.54	0.399			
Treatment						
Operation	1.09	0.52–2.30	0.816			
Chemotherapy	1.76	1.09–2.82	0.020	1.82	1.14–2.91	0.012
Radiotherapy	1.46	0.92–2.32	0.106			
Dietary supplements	1.23	0.81–1.87	0.331			
Uncomfortable side effects of cancer treatment	1.20	1.02–1.42	0.032			
Satisfaction with conventional treatment	1.13	0.91–1.42	0.274			
State anxiety	1.03	0.86–1.24	0.748	0.76	0.58–1.00	0.050
Trait anxiety	1.17	0.98–1.39	0.089	1.46	1.11–1.92	0.007

CI confidence interval

Characteristics associated with use of Kampo

Using the data of the 321 women who completed STAI, 14 items were entered into risk ratio regression analysis to assess the characteristics of backgrounds of Kampo users (Table 5). Univariate and multivariate risk ratios are shown in this table. Using univariate analysis, significant predictors of Kampo use were ‘Chemotherapy’ and ‘Uncomfortable side effects of cancer treatment.’ Multiple risk ratio regression analysis was performed using stepwise methods. In the multiple risk ratio regression analysis, ‘Chemotherapy,’ ‘State anxiety,’ and ‘Trait anxiety’ were related to use or nonuse of Kampo medicine.

Discussion

This is the first report about the perceptions and attitudes of cancer patients to Kampo medicines. In general, cancer patients tend to seek CAM to relieve the anxiety of recurrence or metastasis and the uncomfortable symptoms accompanying cancer treatment. As shown in Table 1, 46.9% of women had taken Kampo or dietary supplements. These orally administered materials are the top two CAM modalities in Japan [6]. People tend to think that these materials are less toxic for their body than conventional medicine, but several adverse events such as drug hepatitis and interstitial pneumonia have been reported [9]. Among them, only 24.4% of women reported that they talk about their ingestion of Kampo medicine or dietary supplements

with their cancer physicians (data not shown). This rate is in accordance with previous research findings in the United States [1]. It is necessary to be aware of the possibility of adverse events induced by CAM modalities when abnormality of liver or kidney function is detected in cancer patients.

In Japan, some Kampo drugs (formulae) are covered by national health insurance. These drugs are authorized by the Japanese government, and their quality is regulated similarly to that of Western-style medicines [6]. Therefore, Japanese physicians and patients tend to regard Kampo medicine as traditional medicine rather than CAM. In this situation, Kampo medicine is considered to be supported by a long history of use, which is lacking for dietary supplements. This background may explain the favorable comments about Kampo medicine in this study.

Because Kampo formulas in Japan are of high quality and contain standardized ingredients, their pharmacologic actions can be studied at the molecular level. Among them, Daikenchuto (DKT) and Rikkunshi-to (RKT) are the best evaluated formulas in terms of their physiological and clinical effects [10]. Most Japanese doctors use these Kampo formulas without paying much attention to the traditional Chinese medicine interpretation of the disease [11]. Because we recruited patients at a gynecology follow-up clinic, not at a Kampo clinic, our data reflect the general status of Kampo medicine in Japan.

This study proved that Kampo users were more likely to have had chemotherapy. Chemotherapy is usually given to advanced, metastatic, or inoperable cancers and is

associated with toxic side effects such as nausea, vomiting, diarrhea, and neuropathy [12]. These characteristics of chemotherapy patients would be the primary reasons for the preference of Kampo use. Moreover, several reports showed the effectiveness of Kampo medicine for the control of these toxic side effects [13, 14]. Japanese doctors would be influenced by these reports and prefer to prescribe Kampo medicine for chemotherapy patients.

This study showed that higher trait anxiety and lower state anxiety were independently associated with Kampo use. Trait anxiety shows the congenital degree of anxiety, so it is quite reasonable that higher trait anxiety was associated with Kampo use. On the other hand, state anxiety shows the present degree of anxiety. It may be that Kampo medication decreased the state anxiety of cancer patients. To clarify such an effect of Kampo medicine, it is necessary to prospectively evaluate the state anxiety before and after Kampo medication.

The limitation of this study is the reliance on self-reported data regarding Kampo or dietary supplement use. The definition of Kampo medicine is somewhat confused with dietary supplements in Japan. To avoid this confusion, we added some explanation about Kampo medicine to the top of the questionnaires. Another limitation of the study is a relatively low response rate of STAI. Among the 420 women who completed parts 1 and 2 of the questionnaire, 321 women completed STAI. STAI consists of two separate sets of 20-item self-rated 4-point scales. Although STAI is a very useful instrument, the fast-paced outpatient setting may preclude study participants from completing two sets of a 20-item scale. To avoid this issue, two types of shorter 6-item version of STAI were developed [15, 16]. It may be convenient to use a shorter version of STAI, but we cannot use it in Japanese. Although we have confirmed that there were no differences in demographic and clinical characteristics between the 420 women who completed parts 1 and 2 of the questionnaire (see Table 1) and the 321 women who completed STAI (see Table 4), we cannot completely refute the possibility of selection bias.

In conclusion, slightly less than one-fourth of Japanese gynecologic cancer patients used Kampo medicine. Kampo users made more favorable comments about Kampo medicine than nonusers. Our findings suggest that the psychological characteristics of individual patients is one factor that can influence the usage of Kampo.

Acknowledgments We thank the women who participated in this study.

Conflict of interest No author has any conflict of interest.

References

1. Eisenberg DM, Davis RB, Ettner SL et al (1998) Trends in alternative medicine use in the United States, 1990–1997: results of a follow-up national survey. *JAMA* 280:1569–1575
2. Ernst E, Cassileth BR (1998) The prevalence of complementary/alternative medicine in cancer: a systematic review. *Cancer (Phila)* 83:777–782
3. Cassileth BR (1999) Complementary and alternative cancer medicine. *J Clin Oncol* 17:44–52
4. Hyodo I, Amano N, Eguchi K et al (2005) Nationwide survey on complementary and alternative medicine in cancer patients in Japan. *J Clin Oncol* 23:2645–2654
5. Imanishi J, Watanabe S, Satoh M et al (1999) Japanese doctors' attitudes to complementary medicine. *Lancet* 354:1735–1736
6. Suzuki N (2004) Complementary and alternative medicine: a Japanese perspective. *Evid Based Complement Altern Med* 1:113–118
7. Spielberger CD (1983) *Manual of the State-Trait Anxiety Inventory*. Consulting Psychologists Press, Palo Alto
8. Nakazato K, Shimonaka Y (1989) The Japanese State-Trait Anxiety Inventory: age and sex differences. *Percept Mot Skills* 69:611–617
9. Ishizaki T, Sasaki F, Ameshima S et al (1996) Pneumonitis during interferon and/or herbal drug therapy in patients with chronic active hepatitis. *Eur Respir J* 9:2691–2696
10. Suzuki H, Inadomi JM, Hibi T (2009) Japanese herbal medicine in functional gastrointestinal disorders. *Neurogastroenterol Motil* 21:688–696
11. Yu F, Takahashi T, Moriya J et al (2006) Traditional Chinese medicine and Kampo: a review from the distant past for the future. *J Int Med Res* 34:231–239
12. Sharma R, Tobin P, Clarke SJ (2005) Management of chemotherapy-induced nausea, vomiting, oral mucositis, and diarrhoea. *Lancet Oncol* 6:93–102
13. Mori K, Kondo T, Kamiyama Y et al (2003) Preventive effect of Kampo medicine (Hangeshashin-to) against irinotecan-induced diarrhea in advanced non-small-cell lung cancer. *Cancer Chemother Pharmacol* 51:403–406
14. Nishioka M, Shimada M, Kurita N et al (2011) The Kampo medicine, Goshajinkigan, prevents neuropathy in patients treated by FOLFOX regimen. *Int J Clin Oncol*. doi:10.1007/s10147-010-0183-1
15. Marteau TM, Bekker H (1992) The development of a six-item short-form of the state scale of the Spielberger State-Trait Anxiety Inventory (STAI). *Br J Clin Psychol* 31:301–306
16. Chlan L, Savik K, Weinert C (2003) Development of a shortened state anxiety scale from the Spielberger State-Trait Anxiety Inventory (STAI) for patients receiving mechanical ventilatory support. *J Nurs Meas* 11:283–293

