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Socio-demographic and medical correlates of the use of biologically based complementary and alternative medicines amongst recent Australian cancer survivors.

Rachael Walshe,[a] Erica L James,[b#] Lesley MacDonald-Wicks,[a] Allison Boyes,[c] Alison Zucca,[c] Afaf Girgis,[d] Christophe Lecathelinais[c]

a. School of Health Sciences
Faculty of Health,
University of Newcastle
Callaghan NSW 2308 Australia
Lesley.Wicks@newcastle.edu.au
b. School of Medicine and Public Health
Faculty of Health,
University of Newcastle, Hunter Medical Research Institute, Priority Research Centre for Health Behaviour, and Priority Research Centre in Physical Activity & Nutrition
Callaghan NSW 2308 Australia
Erica.James@newcastle.edu.au

c. Priority Research Centre for Health Behaviour, University of Newcastle, and Hunter Medical Research Institute,
Callaghan NSW 2308 Australia
Allison.Boyes@newcastle.edu.au
Alison.Zucca@newcastle.edu.au
Christophe.Lecathelinais@newcastle.edu.au

d. Ingham Institute, South Western Sydney Clinical School, UNSW, Liverpool BC NSW 1871 Australia

Correspondence:
Associate Professor Erica James
School of Medicine and Public Health
Faculty of Health,
Level 3, David Maddison Building
Callaghan NSW 2308 Australia
E. Erica.James@newcastle.edu.au
T. +61 2 49138466
F. +61 2 49138148

1

ABSTRACT

Objective: Describe the socio-demographic/medical correlates of the use of biologically based complementary and alternative medicines (BBCAM) amongst a heterogeneous sample of recent cancer survivors.

Method: Cross-sectional analysis was undertaken on the baseline data of a population-based longitudinal study conducted in New South Wales and Victoria, Australia (2006-2008) of cancer survivors 6 months post diagnosis. Participants (n=1,323) completed a self-report survey assessing socio-demographic/medical characteristics and use of BBCAM (dietary supplements or vitamins, herbal treatments, and special diets).

Results: Twenty-seven percent of respondents (n=349) reported using at least one BBCAM to help manage their cancer and related symptoms. Nutritional supplements and vitamins were the most commonly reported BBCAM (23%). Correlates of BBCAM use included cancer type (bowel [OR=3.3; CI:1.8-5.9], breast [OR=2.4; CI:1.4-4.1], head and neck [OR=3.8; CI: 2.0-7.2], haematological [OR=2.0; CI: 1.1-3.7], prostate [OR=1.8; CI: 1.0-3.9] versus melanoma), education level (university degree [OR = 1.6; CI:1.1-2.3] versus secondary school) and treatment types (chemotherapy [OR=2.0; CI:1.4-2.7] versus not, bone marrow/stem cell transplant/immunotherapy [OR=2.3; CI:1.2-4.4] versus not).

Conclusion: Providers should openly discuss the use of complementary and alternative therapies with all cancer patients, and given potential safety concerns, be proactive in exploring BBCAM use among the subgroups of survivors identified in this study.

INTRODUCTION

Complementary and alternative medicine (CAM) use often increases following a cancer diagnosis (Vapiwala et al., 2006) and is more common amongst survivors that the general population (Adams et al., 2005; Velicer and Ulrich, 2008). One component of CAM are 'natural products' (National Center for Complementary and Alternative Medicine, 2007) incorporating biologically based therapies (biologically based complementary and alternative medicines [BBCAM]; herbs, dietary supplements, vitamins, minerals, botanicals, pro-biotics, whole diets, functional foods). BBCAM use is common amongst cancer survivors (Patterson et al., 2003) with previous research examining use of antioxidants and dietary supplements (Cassileth et al., 2008; Greenlee et al., 2009; Hardy, 2008; Lawenda et al., 2008; Michaud et al., 2007; Miller et al., 2009; O'Dea, 2003; Savage, 2008; Simone II et al., 2007), and special diets (dietary regimes promoted as alternatives or adjuncts to cancer therapy for example, Gerson Therapy, the Pritikin Program, juice-based diets) (Brown et al., 2003).

Concern about lack of quality in the preparation of some herbal remedies (Drew and Myers, 1997), along with identification of potentially harmful side effects and dangerous interactions with cancer treatments (Lawenda et al., 2008; McCune et al., 2004; Sparreboom et al., 2004), have led to recommendations that cancer patients discuss CAM use with health care providers (National Cancer Institute, 2009). However fewer than 50% disclose CAM use to providers (Eschiti, 2007; Jazieh et al., 2004; McCune et al., 2004; Sparreboom et al., 2004; Velicer and Ulrich, 2008) and instead report their main source of information as coming from the lay community (Ferrucci et al., 2009; Hann et al., 2005; MacLennan et al., 2002; McCune et al., 2004).

As BBCAM use is common and survivors do not routinely disclose their use to health professionals, it is important to understand who the most common users are and what products they are using. This population-based study aimed to describe the socio-demographic and medical correlates of the use of BBCAM amongst a mixed sample of cancer survivors at six months post-diagnosis.

METHODS

The protocol for the longitudinal population-based *Cancer Survival Study* has been reported in detail elsewhere (Boyes et al., 2011) and was approved by relevant ethics committees (University of Newcastle (H-199-1101), Cancer Institute NSW and Cancer Council Victoria).

3

The sample was recruited from the state-based cancer registries of New South Wales (NSW) and Victoria. Eligibility was restricted to those aged 18–80 years at diagnosis, residents of NSW or Victoria, diagnosed with first histologically confirmed primary cancer (local or metastatic) of any of the top eight incident cancer types in Australia (colorectal, female breast, prostate, melanoma of the skin, lung, Non-Hodgkin's lymphoma, head and neck, leukaemia), considered by their clinician to be physically and mentally capable of participating, sufficiently fluent with the English language to complete the questionnaire, aware of their cancer diagnosis, and alive. Of the 3315 eligible individuals approached, 1360 (41% response rate) returned a questionnaire between January 2006-2008. Results from the 1323 survivors who returned their questionnaire between four and nine months (median = six months) after diagnosis are reported here.

Participants completed a self-report questionnaire assessing socio-demographic and medical characteristics, psychosocial well being and lifestyle behaviours. The use of BBCAM was assessed in relation to their cancer diagnosis or treatment.

Statistical Analyses

Data about the use of BBCAM were missing for 15 participants. Due to small numbers, data from survivors of non-Hodgkins lymphoma and leukaemia were combined to form a 'haematological' category. The proportion of survivors who used each BBCAM was calculated with 95% confidence intervals. The association between BBCAM use and socio-demographic (age, gender, highest education level) and medical variables (cancer type, treatments received) was examined using chi-square analysis. While adjusting for age and gender a priori, variables with a p-value <0.2 were included in a backward stepwise logistic regression model where each variable was removed separately and the model tested until all the variables in the model were statistically significant at p<0.05 on the likelihood ratio test (Hosmer and Lemeshow, 1989). Melanoma was selected as the reference group because it includes both male and female survivor, had a large sample size, and conventional treatments typically don't require nutritional supplements. Adjusted odds ratios and 95% confidence intervals are reported for variables retained in the final model.

RESULTS

The sample characteristics are reported in detail elsewhere (Boyes et al., 2011). In summary, participants' median age was 63 years (range 18 to 80), 59% were male, and the most

common diagnosis was prostate cancer (26%) followed by breast cancer (16%) and melanoma (15%). The sample generally reflected the age and gender profile of the top eight incident cancers diagnosed in Australia in 2005.

A total of 349 (27%; 95% CI: 24%-30%) respondents reported having used one or more BBCAM with the most commonly reported BBCAM being nutritional supplements or vitamins (n=306; 23%; 95% CI: 20%-26%) followed by herbal treatments (n=106; 8%; 95% CI: 6%-10%) and special diet (n=49; 4%; 95% CI: 3%-5%).

Females, and those with breast, head and neck, bowel and haematological cancer survivors reported higher use of BBCAM (Table 1). BBCAM use decreased with age and increased with education (Table 1). Survivors who had undergone chemotherapy, radiotherapy, or other treatments (bone marrow/stem cell transplant, immunotherapy) reported higher use of BBCAM compared to survivors who had never had these treatments.

[TABLE 1 NEAR HERE]

Cancer type, education level, chemotherapy and other treatments (bone marrow, stem cell transplant, immunotherapy) were significantly associated with BBCAM use (Table 2).

[TABLE 2 NEAR HERE]

DISCUSSION

Twenty seven per cent of survivors reported using at least one type of BBCAM since their diagnosis and the results provides a picture of BBCAM use in the early diagnosis and treatment phases of the cancer trajectory. The inclusion of a diversity of survivors enables a direct comparisons to be made between cancer types which other studies could not do due to inclusion of only one or a few cancer types (DiGianni et al., 2002; Eschiti, 2007; Gerber et al., 2006; Greenlee et al., 2009; Jatoi et al., 2005; Jones et al., 2002; Newman et al., 1998; Patterson et al., 2002; Saxe et al., 2008).

Consistent with most previous studies, nutritional supplements and vitamins were the most popular BBCAM reported by participants (Maskarinec et al., 2000; Shumay et al., 2002; Swarup et al., 2006). On the other hand, other research indicates that herbal treatments are

the most commonly used BBCAM (Shumay et al., 2002; Ucan et al., 2008). This could be due to cultural differences between countries where herbal remedies are part of traditional therapies (such as traditional Chinese medicine). Similar to previous studies (Conboy et al., 2005; Ferrucci et al., 2009; Shih et al., 2009; Verhoef et al., 2005), those with a higher level of education were more likely to be users of BBCAM.

Breast cancer patients have been previously identified as high users of BBCAM and CAM in general (DiGianni et al., 2002; Gerber et al., 2006; Miller et al., 2008; Patterson et al., 2002; Saxe et al., 2008). However, we found high levels of BBCAM use amongst bowel cancer, head and neck, and haematological cancer survivors, which has not been previously identified. BBCAM use may be high amongst bowel and head and neck cancers since both the cancer and treatment involve the digestive system - making normal eating difficult and/or digestion poor and potentially leading to referral to a dietitian and subsequent prescription of a supplement, vitamins or special diet in line with evidence based practice. Similarly, participants who had undergone chemotherapy or bone marrow/stem cell transplant/immunotherapy were more likely users of BBCAM. Side effects of chemotherapy such as nausea, reduced appetite and potential weight loss may mean nutritional supplements were recommended to prevent weight loss and ensure nutritional needs are being met.

Strengths and Limitations

The large, population-based, registry-recruited sample adds confidence to the generalisability of findings. That the sample comprises mixed cancer types allows the impact of cancer type to be explored, and this study reports the use of cancer-specific CAM use. Whist recruitment via cancer registries is a strength of this study, registry policies of only recruiting for one study at a time led to fewer breast cancer survivors being recruited (due to a concurrent study recruiting during the same time period), and also meant that comparable data on cancer stage/grade was not available as the two registries used different classification systems. Other potential limitations include that the survey relied on self-reported behaviours rather than a home medication review (that was not possible due to funding restrictions) and that the survey did not distinguish between complementary versus alternative BBCAM use.

Conclusion

One quarter of recent Australian cancer survivors reported BBCAM use. These findings suggest the need for specific health education materials for patients who have received chemotherapy and bone marrow/stem cell transplant/immunotherapy.

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Table 1: Prevalence of use of biologically based complementary and alternative medicines by gender, cancer type, age, education level, and treatment type conducted in New South Wales and Victoria, Australia (2006-2008)

	Number of observations*	Use of BBCAM since diagnosis n (%; 95% CI)	p-value
Gender			<0.001
Male	768	173 (23; 20-25)	
Female	540	176 (33; 29-37)	
Cancer Type			<0.001
Bowel	156	55 (35; 27-43)	
Breast	207	80 (39; 32-46)	
Haematological	180	61 (34; 27-41)	
Head and Neck	94	36 (38; 28-48)	
Lung	132	33 (25; 18-32)	
Melanoma	204	27 (13; 8-18)	
Prostate	335	57 (17; 13-21)	
Age (years)			<0.001
≤ 50	202	75 (37; 30-44)	
51 – 60	629	90 (28; 24-32)	
61 – 70	336	122 (26; 21-30)	
≥ 70	263	62 (21; 16-25)	
Education			0.017
Primary school	73	14 (19;10-28)	
Secondary school	629	151 (24;21-27)	
Certificate or diploma	336	94 (28;23-33)	
University degree	263	87 (33;27-39)	
Treatment type			
Surgery	946	258 (27; 24-30)	0.22
Chemotherapy	434	177 (41; 36-46)	<0.001
Radiotherapy	381	131 (34; 29-39)	<0.001
Hormone Treatment	219	65 (30; 24-36)	0.16
Bone marrow/stem cell transplant or Immunotherapy	46	25 (54; 39-69)	<0.001

BBCAM=biologically based complementary and alternative medicine; p-value on chi square test

* number of observations varies due to missing values for study factors

Table 2: Factors significantly associated with the use of biologically based complementary and alternative medicines conducted in New South Wales and Victoria, Australia (2006-2008)

	Adjusted Odds Ratio (95% CI)[*]	p-value
Cancer Type		<0.001
Bowel	3.3 (1.8 – 5.9)	
Breast	2.4 (1.4 – 4.1)	
Haematological	2.0 (1.1 – 3.7)	
Head & neck	3.8 (2.0 – 7.2)	
Lung	1.8 (0.94 – 3.6)	
Prostate	1.8 (1.0 – 3.9)	
Melanoma	1.00	
Education Level		0.007
Certificate or diploma	1.3 (0.91 – 1.7)	
Primary school	0.91 (0.47 – 1.7)	
University degree	1.6 (1.1 – 2.3)	
Secondary school	1.00	
Chemotherapy		
Yes	1.9 (1.4 – 2.7)	<0.001
Don't Know	0.86 (0.52 – 1.4)	
No	1.00	
BM/SCT/Immunotherapy		0.009
Yes	2.3 (1.2 – 4.4)	
No	1.00	

BM = Bone Marrow; SCT = Stem Cell Transplant; CI = Confidence Interval; p-value on the Wald chi square analysis of effects test *Adjusted for confounders identified a priori: age (p=0.218) and gender (p=0.942).