

more refined staging of the tumour, node, metastases (TNM) classification to analyse the results for the 1396 patients for whom suitable information was available (data not shown). Alternatively, increasing numbers of patients may have been allocated to higher tumour stages because of more extensive staging procedures,¹⁶ resulting in a more favourable outcome in all stages.¹⁷ An increase in the proportion of less aggressive tumours is also possible.¹⁸

While some reports have shown that patients with breast cancer have increased mortality compared with the normal population for as long as they are followed up,¹⁹⁻²¹ other studies have found that such patients' mortality approaches or equals that of the normal population after varying intervals.^{22,23} In our study breast cancer patients had the same mortality as the general female population after 19 years and might therefore be considered cured after that time.

This project was funded by the Netherlands Cancer Society. We thank Dr M Th Verhagen-Teulings for data collection and Professor A Hofman for valuable comments.

- 1 Parkin DM, Muir CS, Whelan SL, Gao YT, Ferlay J, Powell J, eds. *Cancer incidence in five continents*. Vol 6. Lyons: IARC Scientific Publications, 1992.
- 2 Netherlands Central Bureau of Statistics. *Atlas of cancer mortality in the Netherlands 1979-1990*. The Hague: SDU Publishers and CBS Publications, 1992.
- 3 Nab HW, Voogd AC, Crommelin MA, Kluck HM, van der Heijden LH, Coebergh JWW. Breast cancer in the southeastern Netherlands, 1960-1989: trends in incidence and mortality. *Eur J Cancer* 1993;29A:1557-9.
- 4 Caygill CP, Hill MJ. Trends in European breast cancer incidence and possible etiology. *Tumori* 1991;77:126-9.
- 5 National Institutes of Health and National Cancer Institute. *1987 annual cancer statistics review*. Vol 2. Bethesda, MD: NIH, 69-82. (NIH publication No 88-2789.)
- 6 La Vecchia C, Lucchini F, Negri E, Boyle P, Maisonneuve P, Levi F. Trends

of cancer mortality in Europe, 1955-1989. III: Breast and genital sites. *Eur J Cancer* 1992;28A:927-98.

- 7 Miller BA, Feuer EJ, Hankey BJ. Recent incidence trends for breast cancer in women and the relevance of early detection: an update. *C A Cancer J Clin* 1993;43:27-41.
- 8 Cascinelli N, Greco M, Morabito A, Bufalino R, Testori A, Baldini MT, et al. Comparison of long-term survival of 1986 consecutive patients with breast cancer treated at the national cancer institute of Milano, Italy (1971 to 1972 and 1977 to 1978). *Cancer* 1991;68:427-34.
- 9 Hakulinen T, Pukkala E, Hakama M, Lehtonen M, Saxen E, Teppo L. Survival of cancer patients in Finland 1953-1974. *Annals of Clinical Research* 1981;13(suppl 31):48-50.
- 10 Adami H-O, Malmer B, Rutqvist L-E, Persson I, Ries L. Temporal trends in breast cancer survival in Sweden: significant improvements in 20 years. *J Natl Cancer Inst* 1986;76:653-9.
- 11 Nab HW, Mulder PGH, Crommelin MA, van der Heijden LH, Coebergh JWW. Is the peak in breast cancer incidence in sight? A study conducted in the southeastern Netherlands. *Eur J Cancer* 1994;30A:50-2.
- 12 Hakulinen T. Cancer survival corrected for heterogeneity in patient withdrawal. *Biometrics* 1982;38:933-42.
- 13 Berkson J, Gage RP. Calculation of survival rates for cancer. *Proc Staff Meet Mayo Clin* 1950;25:270-86.
- 14 Cox DR. Regression models and life tables. *Journal of Royal Statistical Society* 1972;B34:187-207.
- 15 Hakulinen T, Tenkanen L. Regression analysis of relative survival rates. *Applied Statistics* 1987;36:309-17.
- 16 Danforth DN, Findlay PA, McDonald HD, Lippman ME, Reichert CM, d'Angelo T, et al. Complete axillary lymph node dissection for stage I-II carcinoma of the breast. *J Clin Oncol* 1986;4:655-62.
- 17 Feinstein AR, Sosin DM, Wells CK. The Will Rogers phenomenon. Stage migration and new diagnostic techniques as a source of misleading statistics for survival in cancer. *N Engl J Med* 1985;312:1604-8.
- 18 Joensuu H, Toikkanen S. Comparison of breast carcinomas diagnosed in the 1980s with those diagnosed in the 1940s to 1960s. *BMJ* 1991;303:155-8.
- 19 Langlands AO, Pocock SJ, Kerr GR, Gore SM. Long-term survival of patients with breast cancer: a study of the curability of the disease. *BMJ* 1979;iii:1247-51.
- 20 Brinkley D, Haybittle JL. Long-term survival of women with breast cancer. *Lancet* 1984;ii:1118.
- 21 Rutqvist LE, Wallgren A. Long-term survival of 458 young breast cancer patients. *Cancer* 1985;55:658-65.
- 22 Hibberd AD, Horwood LJ, Wells JE. Long term prognosis of women with breast cancer in New Zealand: study of survival to 30 years. *BMJ* 1983;286:1777-9.
- 23 Duncan W, Kerr GR. The curability of breast cancer. *BMJ* 1976;iii:781-3.

(Accepted 18 April 1994)

Pursuit and practice of complementary therapies by cancer patients receiving conventional treatment

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See editorial by Oh

Abstract

Objectives—To determine what proportion of oncology patients receiving conventional medical treatment also use complementary treatments; to assess which complementary treatments are the most popular and to assess patients' motivation for using them; to evaluate associated advantages and risks.

Design—Postal screening questionnaire followed by semistructured interview.

Setting—Two hospitals in inner London.

Subjects—600 unselected oncology patients aged 18 or over who had known their diagnosis of cancer for at least three months.

Main outcome measures—Prevalence and demography of use of complementary therapies; patients' motivation and expectations of complementary therapies; areas of satisfaction and dissatisfaction associated with conventional and complementary therapies.

Results—415 (69%) patients returned the questionnaire. 16% had used complementary therapies. The most popular were healing, relaxation, visualisation, diets, homoeopathy, vitamins, herbalism, and the Bristol approach. Patients using complementary therapies tended to be younger, of higher social class, and female. Three quarters used two or more therapies. Therapies were mostly used for anticipated antitumour effect. Ill effects of diets and herb treatments were described. Satisfaction with both conventional and complementary therapies was high,

although diets often caused difficulties. Patients using complementary therapies were less satisfied with conventional treatments, largely because of side effects and lack of hope of cure. Benefits of complementary therapies were mainly psychological.

Conclusions—A sizeable percentage of patients receiving conventional treatments for cancer also use complementary therapies. Patient satisfaction with complementary therapies, other than dietary therapies, was high even without the hoped for anticancer effect. Patients reported psychological benefits such as hope and optimism.

Introduction

Complementary or alternative medicine are the names given to a system of health care which lies for the most part outside the mainstream of conventional medicine. It has been described as the growth industry of the 1980s and is predicted to be even more popular in the 1990s. In 1983 the British Medical Association's Board of Science and Education commissioned a working party to assess the practice of complementary or alternative therapies.¹ The report, published in 1986, identified the dissatisfaction of the general public with the increasingly technical approach to medicine, the fragmentation of care due to specialisation, and the loss of bedside skills as contributory factors to the increased popularity of complementary therapies. It noted the heightened expectations of the public caused

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BMJ 1994;309:86-9

by sensational reporting of miracle cures in the media. However, it has also been suggested that the most important reason for the current success of complementary or alternative medicine may be the failure of science and medicine to produce curative treatment for commonly occurring types of cancer and other incurable diseases such as AIDS and multiple sclerosis.²

Studies have repeatedly shown that significant numbers of adults in Britain and other countries use complementary or alternative therapies. In 1980-1, it was estimated, there were about 12 practitioners per 100 000 population in the United Kingdom, with annual consultation rates of 19.5 to 25.7 per 100 population.³ In 1989 the *BMJ* reported that about one in eight Britons use complementary therapies, the most popular being herbal remedies, manipulation, homoeopathy, acupuncture, hypnotherapy, and spiritual healing.⁴ Middle aged, middle class women were the predominant users of these therapies. In a survey carried out at the Hammersmith Hospital, two thirds of cancer patients said that they would accept some form of complementary therapy if it was offered by the hospital.⁵

Little is known about the use of complementary or alternative therapies by specific groups of patients. In 1984 Cassileth reported that 13% of cancer patients in the United States receiving conventional therapy in a cancer centre were also using unorthodox treatments.⁶ The most commonly used therapies were metabolic therapy, diet therapies, megavitamins, mental imagery, spiritual or faith healing, and "immune" therapy. Most of these patients used an unorthodox therapy in the belief that it would control their disease: 41% expected the therapy to effect a cure or remission, 18% anticipated prevention or halt of metastatic growth.

This paper examined the pursuit and practice of complementary therapies by patients with cancer registered in the departments of medical oncology and radiotherapy at St Bartholomew's and Homerton Hospitals, London. The aim of the study was to discover how many patients had used or were using complementary or alternative therapies and to evaluate their experiences of them. As all the patients were attending a conventional oncology clinic the therapies they were using can be considered complementary rather than alternative and will therefore be referred to as such in this paper.

Methods

A postal screening questionnaire and a semi-structured interview were used to collect data on use of complementary therapies. The criteria for entry into the study included a diagnosis of cancer for three months or longer, awareness of the diagnosis, and ability to speak or understand English. Patients with all tumour types and stages of disease were eligible for the study. There was a lower age limit of 18 years. The screening questionnaire defined complementary therapies and gave a comprehensive list of examples. Patients were asked to indicate whether or not they had used any of the therapies listed. A separate category titled "other" gave patients the opportunity to indicate, with details, therapies not on the list. Patients were also asked to give their date of cancer diagnosis, any conventional treatments they had received for their illness, and details of age, sex, occupation, ethnic origin, and marital status. Patient satisfaction with conventional treatment was measured on a five point scale.

All those who had used complementary therapies were invited to participate in an interview. A letter accompanying the screening questionnaire explained

the study to patients and also reassured them that the information they gave on the questionnaire and in the interview was confidential. The interviews were conducted in private, mainly in the outpatient department. Permission from the ethics committee was obtained to carry out the study.

The screening questionnaire was sent to 600 patients registered in the departments of medical oncology and radiotherapy at a London teaching hospital. The last 200 patients in the study were sent the cancer locus of control questionnaire⁷ and the hospital anxiety and depression scale.⁸ The cancer locus of control questionnaire is a 22 item, self rating scale which measures patients' perception of factors influencing the cause and course of their illness. The hospital anxiety and depression scale is a 14 item, self rating scale which assesses the non-somatic symptoms of anxiety and depression.

For statistical analysis, the sample was divided into two groups, those using conventional treatments only and those using conventional and complementary therapies. Differences in the distribution of socio-demographic details and tumour characteristics between the two groups were compared by using the χ^2 test. The Mann-Whitney test was used to compare median scores of the hospital anxiety and depression scale and the cancer locus of control scale.

Results

SCREENING STUDY

A total of 415 (69%) patients returned the questionnaire completed. As this was a postal survey the reasons for non-return could not readily be ascertained but included advanced disease or death of the patient, inability to understand the questionnaire, and incorrect mailing address. Of those patients who returned the screening questionnaire, 65 (16%) had used or were using complementary therapies. Data were combined from the screening questionnaire and interview study to describe which therapies patients used since it became clear during the interviews that patients used more than those described on the screening questionnaire.

The most commonly used therapies were healing, relaxation, visualisation, diets, homoeopathy, vitamins, herbalism, and the Bristol approach (table I). Thirty six (75%) patients used two or more therapies; one patient was using 13 therapies.

Table II shows the sociodemographic and tumour

TABLE II—Characteristics of patients receiving complementary and conventional treatment for cancer. Values are numbers (percentages) unless stated otherwise

	Entire sample (n=415)	Conventional only (n=350)	Conventional plus complementary (n=65)
Sex:			
Male	206 (50)	182 (52)	24 (37)
Female	209 (50)	168 (48)	41 (63)
Median age (years)	56	58	50
Marital status:			
Single	61 (15)	47 (13)	14 (22)
Married	265 (64)	228 (65)	37 (57)
Divorced or separated	36 (9)	29 (8)	7 (11)
Cohabiting	2 (<1)	1 (<1)	1 (<1)
Widow(er)	44 (11)	40 (11)	4 (6)
Unknown	7 (2)	5 (1)	2 (3)
Diagnosis:			
Lung	27 (7)	26 (7)	1 (2)
Breast	41 (10)	37 (11)	4 (6)
Gynaecological	35 (8)	30 (9)	5 (8)
Gastrointestinal	73 (18)	61 (17)	12 (18)
Leukaemia	39 (9)	35 (10)	4 (6)
Lymphatic	105 (25)	81 (23)	24 (37)
Myeloma	14 (3)	10 (3)	4 (6)
Other*	55 (13)	46 (13)	9 (14)
Unknown	26 (6)	24 (7)	2 (3)

*Carcinoid, sarcoma, brain tumour, dysgerminoma, melanoma.

TABLE I—Use of complementary therapies by cancer patients

Therapy	No of patients (n=65)
Healing	42
Relaxation	23
Visualisation	22
Diet (all types)	17
Homoeopathy	16
Vitamins	13
Herbalism	13
Bristol Centre approach	13
Acupuncture	9
Meditation	9
Bach flowers	8
Hypnotherapy	6
Aromatherapy	5
Naturopathy	5
Reflexology	4
Osteopathy	3
Other*	9

*Iridology, biogenics, electrocrystal therapy, Tibetan chanting, Scientology.

characteristics of the patient population according to therapy. Significantly more women than men reported using complementary therapies (1 in 5 women *v* 1 in 8 men; $P < 0.05$). Patients using complementary therapies were younger than those using only conventional therapy (50 *v* 58 years; $P = 0.005$). Demographic details of marital status and ethnic origin showed no significant differences between those who used complementary therapies and those who did not. Over half (58%) of those using complementary therapies were in socioeconomic groups 1 (professional), 2 (intermediate), and 3N (skilled, non-manual) in comparison with 33% patients using conventional treatments only (38/65 *v* 116/350; $P < 0.01$; table III). Patients with lymphoma were more likely to use complementary therapies than any other group in this study (24/105 *v* 41/310; $P < 0.05$).

TABLE III—Social class of cancer patients ($n=65$) using complementary therapy in addition to conventional treatment. Values are numbers (percentages)

	Conventional only ($n=350$)	Conventional plus complementary ($n=65$)
Professional	7 (2)	1 (2)
Intermediate	46 (13)	15 (22)
Skilled non-manual	63 (18)	22 (34)
Skilled manual	70 (20)	8 (12)
Partly skilled	81 (23)	7 (11)
Retired	42 (12)	8 (12)
Unskilled	7 (2)	3 (5)
Housewife	32 (9)	1 (2)

With regard to patients' satisfaction with conventional treatment, 14% (9/65) in the complementary therapy group reported some dissatisfaction with conventional treatment, compared with 3% (10/350) of those who received conventional treatment only.

One hundred and thirty five (68%) out of 200 patients completed the hospital anxiety and depression scale and the cancer locus of control questionnaire (17 in the complementary therapy group and 118 in the conventional treatment only group). Those patients using complementary therapies were significantly more anxious than those in the conventional treatment group (median scores 8 and 6 respectively; $P < 0.01$). The two groups did not differ significantly in their depression scores. Analysis of the locus of control scores revealed that patients using complementary therapies were more likely to have a higher internal control over the origin or cause of their illness than those using conventional treatment only (median scores of 20.5 and 27 respectively, lower scores indicating higher internal control; $P = 0.006$). However, the two groups did not differ significantly on factors influencing the course of their illness, including internal control.

INTERVIEW STUDY

Forty eight (74%) of the patients using complementary therapies agreed to participate in the interview. Of this group, 36 (75%) had begun to use complementary therapies during or after the time they were receiving active conventional treatment. Of the 12 who started a therapy at some point before receiving conventional treatment, five did so because they were told there was no conventional treatment available at that time.

Patients were asked to explain their attraction to complementary therapies. Twenty eight said that they felt more hopeful than when using conventional treatment alone; 20 were attracted to the perceived non-toxic, holistic nature of the remedies; 12 wanted therapies which allowed more patient participation in treatment; and eight mentioned the supportive relationship with the practitioner as important. Many

patients reported more than one reason for using the therapies. Twelve patients commented that they had understood that their condition was incurable in spite of conventional treatment, a factor which prompted them to turn to a complementary therapy.

Patients were asked to define their expectations of the therapy they were using. Thirty five expected some physical effect on their illness: eight expected a cure, 14 expected remission of disease or prevention of spread, and 13 expected that therapy would boost the immune system, making them stronger to fight the illness. Nine patients expected improvement in quality of life without any physical effect on the disease, and four were unable to define their expectations.

When asked if their doctors were aware that they were using complementary therapies, 26 said that their doctors did not know. Of the 22 patients whose doctors were aware, 10 said that their hospital doctor was supportive and 15 that their family doctor was supportive.

Satisfaction with treatment

At the end of the interview the patients were asked to describe their satisfaction with the complementary therapy they had used. Since several patients used more than one therapy their satisfaction with each individual therapy varied, but overall 39 (82%) were either satisfied or very satisfied with the therapies they had chosen. Those satisfied with the therapies described the benefits as being both physical and psychological. Patients reported feeling calmer after using relaxation and visualisation techniques. Other psychological benefits reported by patients included feeling emotionally stronger, being more able to cope with the demands of the illness, and feeling more optimistic and hopeful about the future. Individual patients reported specific physical effects, including less difficulty in breathing, increased energy, and reduced feelings of nausea.

Dissatisfaction focused on diet therapies and herbalism. Of the 17 patients who tried a diet therapy, six reported some difficulties. These included extreme weight loss, the restrictive and unpalatable nature of the diet, and the time spent preparing the food. The diet was often expensive and the ingredients difficult to find. Two patients experienced problems with herbalism: one described feeling physically unwell while receiving the herbal remedy and the other was pressurised by the herbalist to continue treatment when he no longer wished to do so. One patient experienced difficulty with a healer, who informed the patient that he was cured and no further medical treatment was necessary.

There were also specific areas of dissatisfaction identified with conventional treatment. These involved doctor-patient interactions, the most commonly mentioned being the perception by the patient of being left in a no hope situation. The side effects of conventional treatment were also perceived as distressing. However most patients expressed satisfaction with their conventional treatment.

Discussion

Much has been written about complementary therapies, including the difficulties in scientifically evaluating their effect in physical and psychological terms, and therefore there has also been controversy over the benefits and risks they offer to patients.¹⁰ This study was not an attempt to investigate scientifically the impact of complementary therapies but rather to look at an unselected group of cancer patients to discover what proportion used complementary therapies and why.

Sixteen per cent of the cancer patients surveyed used

at least one complementary therapy, most outside the hospital setting. This figure is slightly higher than in Cassileth's study in the United States in 1984, where 13% of patients had used complementary therapies.⁶ Cassileth, however, excluded those patients using unorthodox treatments for psychological reasons only. The findings of this study seem to mirror those of Thomas,⁹ who showed that non-orthodox health care within the United Kingdom seems to be used more often as a supplement to, rather than a substitute for, conventional care. However, no comment can be made regarding those patients who may have rejected conventional therapy in favour of alternative treatments from the outset. Our study shows that cancer patients who use complementary therapies tend to be younger and of higher social class and are more likely to be female. Unlike in the United States, where metabolic therapies, diets, and megavitamins predominate,⁶ the mind-body therapies (healing and visualisation, for example) were the most popular among this British group of cancer patients.

Patients using complementary therapies were shown to be more anxious, as rated by the hospital anxiety and depression scale, than those receiving conventional treatment only. One reason could be that this group of patients scored higher on the cancer locus of control questionnaire's dimension of internal control over cause/origin. Patients who attribute the cause of their illness to something within themselves may carry an undue burden of responsibility for their illness and thus become anxious. It may also be assumed that patients who attribute the cause of the disease to one of their own attributes may be more likely to think that if they change their lifestyle in some way—through diet or stress reduction, for example—they may influence the outcome of their disease.

The patients interviewed were those who had used complementary therapies and were therefore a self selected group of patients. It is not surprising, therefore, that there was a higher incidence of dissatisfaction with conventional treatment within this group than in those using conventional treatment only. Despite this, most patients using complementary therapies were also satisfied with conventional treatment.

Although most patients in this study initially approached complementary therapy with the expectation of an effect on their disease, they remained satisfied with the therapies they had chosen even though this did not occur (with the exception of the dietary therapies, with which a considerable proportion had problems), with a subjective feeling of improved quality of life and few attendant ill effects. This differs from Cassileth's 1991 findings, which indicated that patients receiving unproved cancer therapies in conjunction with conventional therapies had a poorer quality of life than those receiving conventional treatment only.¹¹ However, the patients in Cassileth's study were following extreme regimens, including severe dietary restrictions, coffee enemas, and injections of BCG, so parallels cannot readily be drawn.

PSYCHOLOGICAL SUPPORT

Previous research suggests that many patients are prepared to have conventional treatment even if there is only a very small chance of cure.¹² This study reinforces the belief that for many cancer patients hope

Clinical implications

- Clinicians ought to be conversant with the popular forms of complementary therapies
- Complementary therapies can have psychological benefits for patients
- Dietary therapies can cause significant weight loss in compromised cancer patients
- Clinicians should not underestimate the value of a hopeful attitude in their management of cancer patients

is an important issue, since this was the main area of dissatisfaction our respondents highlighted. If hope is not imparted by conventional practitioners some patients may seek it from complementary therapists. It is important for doctors and nurses to establish good communication and maintain a hopeful attitude when dealing with cancer patients, fostering a more collaborative approach to management.

Patients seeking out complementary therapies are undoubtedly aware of the concern felt by conventional practitioners about their use and are often reluctant to disclose such information. Although this concern on the part of the medical profession is entirely appropriate, doctors and nurses must be able to discuss the issues with their patients in an open minded, well informed manner. They should be prepared to accept that for some cancer patients complementary therapies fulfil an important psychological need. Psychological support is no longer considered to be complementary to conventional care but is now seen as an integral part of good cancer medicine. Patients can benefit greatly by this approach. The main area of concern and potential harm identified in this study was that of dietary therapies, which were for the most part expensive, impractical, and unpleasant.

Finally it must be acknowledged that some cancer patients will always be attracted to complementary therapies. Doctors and nurses caring for this group of patients can play a valuable part in assisting patients to make informed choices about such therapies, thus ensuring that the risks of such therapies are minimised and only the benefits gained.

- 1 Board of Science and Education, British Medical Association. *Alternative therapy*. London: BMA, 1986.
- 2 Lerner IJ. The whys of cancer quackery. *Cancer* 1984;53:815-9.
- 3 Fulder SJ, Monro RE. *The status of complementary medicine in the UK*. London: Threshold Foundation, 1982.
- 4 Aldridge D. Europe looks at complementary therapy. *BMJ* 1989;299:1211-2.
- 5 Sikora K. Complementary medicine and cancer. *Cancer Care* 1990;7:9-11.
- 6 Cassileth B, Lush EJ, Strouse TB, Bodenheimer BJ. Contemporary unorthodox treatment in cancer medicine: a study of patients, treatments and practitioners. *Ann Intern Med* 1984;101:105-12.
- 7 Dickson AD, Dodd MJ, Carrieri V, Levenson H. Comparison of a cancer-specific locus of control and the multidimensional health locus of control scales in chemotherapy patients. *Oncol Nurs Forum* 1985;12:49-54.
- 8 Zigmund AS, Snaith RP. The hospital anxiety and depression scale. *Acta Psychiatr Scand* 1983;67:361-70.
- 9 Thomas KJ, Carr J, Westlake L, Williams BT. Use of non-orthodox and conventional health care in Great Britain. *BMJ* 1991;302:207-10.
- 10 Bagenal FS, Easton DF, Harris E, Chilvers CED. Survival of patients with breast cancer attending Bristol Cancer Help Centre. *Lancet* 1990;336:1185-8.
- 11 Slewin ML, Stubbs L, Plant H, Wilson P, Gregory WM, Armes PJ, et al. Attitudes to chemotherapy: comparing views of patients with cancer with those of doctors, nurses, and general public. *BMJ* 1990;300:1458-60.

(Accepted 11 March 1994)