Evidence, safety and recommendations for when to use acupuncture for treating cancer related symptoms: a narrative review

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ABSTRACT

Background: Recently research on acupuncture for cancer related symptoms has significantly increased. To what extent have medical professionals recommended to use acupuncture in light of that evidence?

Methods: Evidence of effectiveness and safety was found by searching Pubmed for reviews to identify for what conditions and general results. Publications that recommend acupuncture in oncology were searched in the database of an ongoing general search for publications that recommend acupuncture. This database was developed by searching google for publications that recommend the use of acupuncture with the terms 'name of symptom' and 'clinical practice guideline' or 'treatment guideline'.

Results: Acupuncture is moderately or weakly effective for 19 symptoms in patients with cancer and cancer survivors. Acupuncture is a safe therapy in cancer care if administered by trained acupuncturists. Acupuncture is targeted to improve symptoms associated with the cancer and different cancer treatments, not to treat the cancer itself. More than 350 publications by clinical practice guideline groups and expert groups, including public health statements made by national and government agencies recommended the use of acupuncture for 61 cancer related symptoms many with positive evidence of effectiveness.

Conclusion: The strength of evidence is weak for many indications, however the evidence for many standard therapies is either not very strong or if stronger, the incidence of adverse events is more, which makes acupuncture a treatment option despite the weak evidence. We have found evidence that many oncologists around the world have started to incorporate acupuncture into the treatment of various cancer related symptoms.

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1. Introduction

Acupuncture is increasingly used by patients with cancer to help treat symptoms of cancer, side effects of cancer therapies and in cancer survivors.1-4 with a growing body of research and evidence in cancer care.2-4 This short narrative review summarizes evidence of effectiveness and safety of acupuncture for a range of symptoms in cancer patients and emergent evidence regarding how oncology specialists and oncology groups have digested that evidence and recommend acupuncture in patients with cancer and in cancer survivors.

2. Methods

Publications that describe evidence of effectiveness and safety in the use of acupuncture in different cancer related symptoms were searched for by identifying Systematic Reviews and review articles in Pubmed using ‘acupuncture’, ‘cancer’, ‘review’, ‘clinical trials’ as search terms. Publications that were found were then hand searched to examine the papers they cite to identify other publications. All publications found by this snow-balling approach were reviewed to identify what conditions are mentioned, whether there was any positive evidence and the relative strength of that evidence. A similar search found publications that discussed the safety of acupuncture, also in oncology. The search strategy for publications that recommend acupuncture involved an evolving snowball approach on the google search engine using key words such as ‘clinical practice guideline’, ‘treatment guideline’ and the name of the...
symptom. This approach led not only to article publications but many websites, each of which was searched for further references or websites, these links often led to others. Details of this search strategy are described elsewhere.\(^5\)

### 3. Results

#### 3.1. Effectiveness of acupuncture in oncology

The November 1997 US National Institutes of Health ‘Consensus Development Conference on Acupuncture’ evaluated the available clinical trial evidence for acupuncture concluding that acupuncture was effective for three conditions, including chemotherapy induced nausea and vomiting (CINV).\(^6\) Over the next few years other groups also concluded that acupuncture was effective for CINV,\(^7,8\) but there was as yet too little research to draw clear conclusions about other cancer-related symptoms. In the years since then, clinical trial research on acupuncture has grown significantly.\(^9\) During this time the number of studies in cancer patients also increased.\(^1,2\) There is a growing body of research on acupuncture in cancer care and cancer-related symptoms where many positive findings have emerged.\(^3-4\) The strength of evidence is not yet strong for symptoms other than CINV,\(^10,11\) but it has increased so that authors now recognize that acupuncture may be effective for cancer pain,\(^10,11\) aromatase inhibitor induced arthralgia (in breast cancer), fatigue, recovery after colorectal cancer resection\(^11\) as well as symptoms also seen commonly in cancer patients such as post-operative nausea and vomiting (PONV), anxiety, depression and sleep problems.\(^10,11\) The following symptoms have been found to have clearly positive or trend positive findings in reviews:\(^5\) CINV,\(^12-22\) PONV,\(^13\) post-op pain,\(^23-25\) cancer related pain,\(^14,17,19,21,26-29\) arthralgia from aromatase inhibitors,\(^30-33\) xerostomia,\(^34-39\) hot flashes (especially in breast cancer),\(^12,14,17,22,23,31,40-42\) fatigue,\(^17,21,22,31,34,43-47\) depression,\(^48,49\) anxiety,\(^48,50\) sleep problems,\(^48-51\) chemotherapy-induced peripheral neuropathy (CIPN),\(^31,52-55\) hiccup,\(^21,22,56\) dyspnea in palliative care,\(^57\) radiation induced nausea and vomiting (RINV),\(^34\) lymphoedema,\(^31,58\) leucopenia,\(^22\) post-op gastroparesis,\(^21,59\) and quality of life in cancer patients.\(^21,45,48\)

Recently we also find oncologists recognizing that acupuncture has a further potential. Many cancer patients have ‘symptom clusters’\(^66\) rather than single symptoms. From the above evidence we can see that acupuncture appears able to treat not only single symptoms but probably also symptom clusters, making it a somewhat unique therapy among treatment options in oncology practice.\(^22\) Further, some reviews have found that acupuncture may be one of the best treatment options for certain cancer related symptoms “To date, only acupuncture and exercise have been demonstrated to result in a statistically significant improvement in aromatase inhibitor-associated symptoms.”\(^67\) These results have been recently confirmed.\(^14\) On the other hand, for many of the symptoms for which acupuncture is used, the evidence is still relatively weak. A rationale for recommending acupuncture when the evidence is still weak is stated by Berger et al. “Although evidence of the beneficial effects on fatigue outcomes is not particularly strong for interventions such as acupuncture, massage, or bright light, use of these therapies in clinical practice for fatigue management can be rationalized based on the fact that they are generally well tolerated and may be efficacious in particular fatigue contexts or may favourably affect symptoms that amplify fatigue, including anxiety, depression, sleep disturbance, and pain.”\(^64\) In their 2013 review Towler et al stated their rationale thus: “Acupuncture should be considered for symptom management where there are limited treatment options, using current peer-reviewed guidelines and clinical reasoning.”\(^65\) These arguments seem to be gaining ground among oncology groups where treatment challenges are severe and effective therapies often hard to establish. Patients demand other options since they are often under-treated for their cancer symptoms\(^66,67\) and usual treatments can result in inadequately controlled symptoms.\(^21,68\) The recent breast cancer guideline from the German National Gynaecological Oncologist Group recommends acupuncture for 13 different symptoms in breast cancer treatment despite the weak evidence for many of them.\(^59\)

#### 3.2. Safety of acupuncture

In general acupuncture is considered to be a safe therapy when practiced by qualified practitioners.\(^8,11,70-73\) with publications in oncology describing it as a safe therapy.\(^74-76\) Acupuncture is also seen to be safe in paediatrics.\(^77-79\) and in paediatric cancer patients it is said to be safe,\(^78,80-82\) feasible and well tolerated.\(^78\)

#### 3.3. Recommendations to use acupuncture in oncology

When a therapy has evidence of effectiveness and safety it starts to be considered as a treatment option by Clinical Practice Guidelines (CPG) development groups.\(^83\) A recent publication based on an extensive search through August 2017 for publications that recommend acupuncture has found acupuncture to be more extensively recommended by CPG and expert groups than was previously thought.\(^5\) These recommendations generally appear to be evidence based.\(^3\) Since August 2017 searching for such publications has continued. At present the current number of recommendations to use acupuncture in the search database is for over 5100 recommendations covering more than 340 different symptoms [Birch et al, unpublished data]. How many of these are cancer related? What kind of groups have made these recommendations?

Table 1 summarizes current unpublished data from the ongoing search in relation to cancer related symptoms covering 61 symptoms in cancer care [Birch, unpublished data]. Publications recommending acupuncture in cancer patients starts to emerge in the late 1990s, gradually increasing in the early 2000s and in recent years have more rapidly increased. This trend can be seen in figure one in a previous paper by the authors.\(^5\) Some of the recommendations appear in updated publications from the same sources and thus the number of recommendations includes several for a symptom from the same source. The total number of institutions and groups that make recommendations is thus smaller than the total number of recommendations per symptom.

Looking at the most commonly indicated symptoms among the more than 5100 recommendations found to date, CINV, cancer pain, cancer related fatigue, cancer related hot flashes and associated symptoms of PONV, post-op pain, anxiety and depression are among the 20 most recommended symptoms for the use of acupuncture [Birch, unpublished data], all of which have positive or trend positive evidence of effectiveness.

Out of the recommendations for the use of acupuncture in symptom management in cancer patients, many are made by national and state government and health departments (+ in Table 1), indicating broad public health support for the use of acupuncture. Appendix 2 in a recent paper by the authors lists examples of publications recommending acupuncture, including some for cancer patients.\(^5\) Table 2 lists those symptoms for which acupuncture is recommended by national and state government and public health service groups.

In Table 2, we see that publications from the Australian Government recommend acupuncture for at least nine symptoms in cancer care with recommendations for an additional three symptoms by State Governments in Australia. In recent years, acupuncture has been recommended for at least 25 symptoms in cancer care by different regional or central NHS websites in the UK. Surveys have found that acupuncture is increasingly used by patients.
| Cancer related symptoms                        | Nr. rec | Countries                                                                 | Years of publication |
|-----------------------------------------------|---------|----------------------------------------------------------------------------|-----------------------|
| CINV                                          | 275     | International, UK+, Scotland+, Wales+, Germany β, France, Austria, Netherland, Denmark, US+, Australia+, New Zealand+, Canada+, Saudi Arabia, Brazil, S. America, India | 1998–2019            |
| Cancer pain                                   | 243     | International, UK+, Scotland β, Wales+, Northern Ireland+, Germany β, Netherlands, Denmark, Norway, Spain, Romania, US+β, Australia+, New Zealand, Canada+, Mexico β, Latin America, China+, Hong Kong, India, Malaysia+, Singapore+, Kenya+ | 1994–2019            |
| Dyspnoea                                      |         |                                                                            |                       |
| Fatigue                                       | 97      | International, US+, UK+, Germany β, Canada+, Australia+, New Zealand+, Mexico β | 2006–2019            |
| Xerostomia                                    | 75      | International, US+, UK+, Canada+, Germany β, Italy, Poland, Croatia, India | 2005–2019            |
| Post-surgery pain                             | >50     | US+, UK, Australia+, New Zealand+, Germany β, Rwanda+, International, Malaysia+, | 2006–2019            |
| PONV                                          | >50     | UK, Scotland, US, Canada, Australia+, New Zealand, Germany β, Netherlands, Brazil | 2003–2019            |
| Hot flashes (especially breast cancer)        | 95      | US+, Canada, UK+, Europe, Australia+, NZ, Sweden, Norway, Denmark, Germany β, Mexico β, India | 2005–2019            |
| Aromatase-inhibitor arthralgia (breast cancer)| 45      | UK+, US+β, Germany β, NZ, Turkey, India, Taiwan                             | 2007–2016            |
| Neuropathy                                    | 79      | US+, Canada+, Australia, UK+, Europe, International, Germany β, Denmark, Ireland, Hong Kong, Mexico β | 2007–2019            |
| Anxiety                                       | 43      | US+, UK+, Canada+, Germany β, NZ, International                            | 2006–2017            |
| Dyspnœa (especially in palliative care)       | 33      | Denmark, US, UK+, Australia+, Canada+                                      | 2005–2019            |
| Quality of life (QoL) or well-being in cancer | 25      | Denmark, US+, Canada+, Australia+, NZ                                      | 2009–2017            |
| Depression                                    | 24      | Germany β, UK+, US+, Canada+, NZ                                            | 2010–2017            |
| Insomnia                                      | 22      | Australia+, US+, Canada, Germany β                                          | 2011–2019            |
| Symptom relief in cancer                      | 16      | Taiwan, Australia+, US+                                                    | 2003–2015            |
| Lymphoedema                                   | 12      | Mexico β, US, Europe, Germany β, India                                      | 2005–2015            |
| Breathlessness                                | 12      | UK+                                                                        | 2012–2018            |
| Stress                                        | 10      | UK+                                                                        | 2006–2019            |
| Hiccups in palliative care                    | 9       | Denmark, UK+, Scotland+, Canada+, India                                     | 2009–2017            |
| Constipation in cancer                        | 8       | US+, Canada+, Germany β                                                    | 2013–2019            |
| Cognitive dysfunction in cancer               | 6       | Germany β                                                                  | 2012–2018            |
| Mood problems in breast cancer                | 5       | US, UK*                                                                    | 2014–2019            |
| Leucopenia                                    | 4       | Germany β                                                                  | 2014–2017            |
| Muscle spasm/dysfunction (especially after head/neck surgery) | 4 | US, UK+ | 2007–2013 |
| Menopausal symptoms in cancer (especially in breast cancer) | 4 | NZ, UK+ | 2017–2018 |
| Loss of appetite in cancer                    | 4       | US+                                                                        | 2015–2019            |
| Radiation induced nausea and vomiting, RINJ   | 4       | US, Denmark                                                                | 2008–2018            |
| Phantom limb pain                             | 3       | UK+                                                                        | 2014–2018            |
| Swallowing difficulties in cancer             | 3       | US                                                                          | 2015                 |
| Weight loss in cancer                         | 3       | US+                                                                        | 2015–2019            |
| Diarrhoea in cancer                           | 3       | US+                                                                        | 2015–2019            |
| Palliative care for elderly                   | 2       | Australia+, Canada                                                        | 2011–2013            |
| Night sweats                                  | 2       | UK+                                                                        | 2008                 |
| Myoclonus in palliative care                  | 2       | Denmark, South Africa β                                                    | 2012–2016            |
| Headache in cancer                            | 2       | US                                                                          | 2014                 |
| Pruritus in palliative care                   | 2       | Denmark, UK+                                                               | 2008                 |
| Painful bowel movements                       | 2       | UK+                                                                        | 2015–2018            |
| Hyperhidrosis                                 | 2       | UK+                                                                        | 2014                 |
| Muscular pain                                 | 2       | UK+, Canada                                                                | 2008–2013            |
| Dystonia – palliative care                    | 1       | South Africa β                                                            | 2012                 |
| Weight loss in cancer                         |         | US                                                                          | 2015                 |
| Radiation proctitis                           |         | UK                                                                          | 2006                 |
| Musculositis-related pain                     |         | US                                                                          | 2008                 |
| Cancer-related infertility                    |         | US                                                                          | 2009                 |
| Post-op muscular discomfort                   |         | Germany β                                                                  | 2016                 |
| Radiation-related abdominal pain/loating      |         | UK                                                                          | 2014                 |
| Radiation-related anal pain (proctalgia fugax)|         | UK                                                                          | 2014                 |
| Palliative Care                               |         | UK+                                                                        | 2013                 |
| Panic attacks                                 |         | UK                                                                          | 2008                 |
with cancer.\textsuperscript{3,28,84} Official oncology groups have been recommending acupuncture for a slowly growing list of symptoms in cancer care, for example in the US: American Cancer Society,\textsuperscript{85} National Cancer Comprehensive Network,\textsuperscript{86} UK: MacMillan,\textsuperscript{87} Germany: Arbeitsgemeinschaft Gynakologische Onkologie,\textsuperscript{88} Europe: European Oncology Nursing Society,\textsuperscript{58} Canada: Cancer Care Ontario,\textsuperscript{89} Pediatric Oncology Group of Ontario,\textsuperscript{90} Australia: Cancer Council Australia,\textsuperscript{91} New Zealand: New Zealand Gynecological Cancer Foundation.\textsuperscript{26} National government or health service publications also make many recommendations to use acupuncture, see for example the Scottish NHS,\textsuperscript{93} the Australian Government: Cancer Australia,\textsuperscript{94} Health Direct,\textsuperscript{95} New Zealand Government: Ministry of Health New Zealand,\textsuperscript{96} US National Cancer Institute,\textsuperscript{97} the Canadian State governments of Alberta\textsuperscript{98} and British Columbia\textsuperscript{99} and so on. This interest in the use of acupuncture in cancer care is especially found outside of Asia. A few Asian Ministry of Health publications have found been recommending acupuncture for cancer related symptoms like pain in China,\textsuperscript{99} Malaysia,\textsuperscript{100} and Singapore.\textsuperscript{101} But none have been found to date in Japan and South Korea. It is interesting that use of acupuncture in cancer care is growing in Europe, North America and Australasia, but is being less widely adopted in East Asia. Occasionally international groups such as the World Health Organization\textsuperscript{102} and some European groups\textsuperscript{88,103} and Pan-American groups\textsuperscript{104} have made recommendations to use acupuncture in cancer care.

Since the evidence of effectiveness is relatively weak due in part to the small number of studies with small sample sizes,\textsuperscript{1,4,10} and acupuncture is being widely adopted and recommended in cancer care, it is important that more clinical trials be performed examining the additive role of acupuncture in managing the various symptoms of patients with cancer. The Society for Integrative Oncology has been tracking evidence for the use of integrative therapies like acupuncture\textsuperscript{105} and has published guidelines promoting their use in oncology practice.\textsuperscript{106} Previous publications have discussed problems of implementation of published guidelines and how the many recommendations to use acupuncture have been under-utilized.\textsuperscript{11,83} The acupuncture field needs to work with oncologists and public health officials to develop more effective implementation strategies if the growing recommendations to use acupuncture in cancer care are to be followed.
4. Conclusions

As can be seen above, the use of acupuncture in oncology is growing. This is probably due to many factors such as the demands of patients; the fact that patients are often under-treated for their cancer symptoms; that usual treatments can result in inadequately controlled symptoms; that acupuncture is considered safe with a growing evidence base of effectiveness for a number of cancer related symptoms. Acupuncture is an interesting option for many cancer patients and cancer survivors because: it can simultaneously address so many different types of cancer-related symptoms with a relatively low risk of adverse effects; it is well tolerated even among pediatric patients; it is especially useful for addressing the common ‘symptom clusters’ in cancer care. Further research is needed to more firmly establish the use of acupuncture in symptom management for patients with cancer and in cancer survivors. Better implementation strategies are needed to help ensure patients are able to follow-up on recommendations to use acupuncture.

Conflicts of interest

The lead author has received a grant to establish an online searchable registry of the found publications that recommend acupuncture.

Funding

Funding for the registry came as a research grant from the British Acupuncture Council, the study was approved in late 2018.

Data availability

At present the data on recommendations for the use of acupuncture is unavailable, but it is planned to have the registry complete around the end of 2020. This will be an online searchable registry.

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