Complementary Therapies in Clinical Practice 32 (2018) 163–168

Contents lists available at ScienceDirect

Complementary Therapies in Clinical Practice

journal homepage: www.elsevier.com/locate/ctcp

An assessment of methodological quality of systematic reviews of acupuncture and related therapies for cancer-related pain

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ARTICLE INFO

Keywords:
Acupuncture
Cancer-related pain
Patients with cancer
A systematic literature review
Meta-analyses

ABSTRACT

Background and purpose: There currently exist many systematic reviews aimed at assessing acupuncture and related therapy effectiveness in cancer-related pain management. However, the methodological quality of existing systematic reviews remains unclear. The purpose of this review was to summarize and evaluate the methodological quality of these systematic reviews and meta-analyses papers.

Methods: A comprehensive search on multiple databases was performed using Assessing the Methodological Quality of Systematic Reviews (AMSTAR).

Results: Fourteen systematic reviews published between 2005 and 2017 were eligible for inclusion. The consensus across the included reviews was that acupuncture and related therapies alone did not have superior pain-relieving effects as compared with analgesic administration using various validated pain scales. However, as compared with analgesic administration alone, acupuncture and related therapies plus analgesics resulted in reduced cancer related-pain.

Conclusion: The study findings emphasized that acupuncture and related therapies alone did not have clinically significant effects at cancer-related pain reduction as compared with analgesic administration alone. Clinicians may consider acupuncture and related therapies as adjunctive therapies for cancer-related pain management, in particular, when pain control is unsatisfactory under analgesics alone. Furthermore, the researchers should conduct the SRs and meta-analyses according to the AMSTAR and PRISMA.

1. Introduction

Pain is one of the most common, feared, and distressing symptoms experienced by patients with cancer [1]. Cancer-Related Pain (CRP) occurs via two major mechanisms which include local tumor extension into surrounding tissue and metastasis of primary tumors to distant sites or via anti-cancer treatments, including surgery, chemotherapy, and radiation [2]. Further, CRP can be classified into nociceptive and neuropathic pain [3]. Nociceptive pain occurs via visceral or somatic tissue injury and resultant noxious stimuli while neuropathic pain stems from abnormal afferent or pain center nerve impulses via peripheral or central nerve injury [4].

The prevalence of Cancer-Related Pain (CRP) has been estimated to be 39.3% after curative treatment, 55.0% during anti-cancer treatment, and 66.4% in advanced cancer [5]. In addition, up to 70% of patients with CRP do not receive adequate pain relief, and this reduces their quality of life [6].

In today's world, the choices of complementary and alternative therapies have started to emerge into the health care services and are being used substantially [7]. As a part of these therapies, acupuncture has shown an important role in the management of CRP [6,8,9]. Acupuncture is listed in the National Comprehensive Cancer Network oncology guidelines (2017) as integrative interventions for CRP among patients with cancer [10].

Acupuncture is one of the major treatment modalities in traditional Chinese medicine. It refers to a group of therapeutic techniques characterized by needle insertion into specific points on the body, followed by either manual manipulation or electrical stimulation of needles (electroacupuncture) [11]. Related therapies such as the application of pressure without needles (acupressure), the application of heat (moxibustion), transcutaneous electrical nerve stimulation (TENS), and the application of light lasers instead of needles (laser acupuncture) are also often used separately or together with acupuncture. Acupuncture and related therapies have been widely used in managing various diseases, symptoms and improve health for more than 2000 years. Historically, acupuncture anesthesia was first used for dental operations in China, followed by tonsillectomies, thyroidectomies, hernia repairs, and changing of burn dressings [12].

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https://doi.org/10.1016/j.ctcp.2018.06.013
Received 14 April 2018; Received in revised form 23 June 2018; Accepted 29 June 2018

There are several theories for how acupuncture can relief pain. The most common theory is the endorphin theory [13]. This theory showed that when needles are inserted in the right acupoints, endorphins, which are natural painkillers, are released [14]. The endorphins then travel to the spinal cord and brain to relieve pain. Additionally, acupuncture may act in pain modulation via principles described in gate theory that states CRP may be inhibited centrally by concurrent sensory input (needling) [15]. Another theory of possible modulation is described by diffuse noxious inhibitory control (DNIC) implying that heterotopic body area noxious stimulation decreases pain sensation originating locally by tumor presence [16].

A growing number of randomized controlled trials (RCTs) of acupuncture and related therapies for CRP have been published over the past two decades. From the viewpoint of research design for these RCTs, acupuncture and related therapies presents a range of challenges. Acupuncture included a variety of methods and techniques, which may not be directly comparable [6,17]. Owing to the characteristics of acupuncture, it is difficult to blind acupuncturist. In addition, it is impossible to a blind participant when the trial comparing acupuncture with oral medication or other kind of treatment instead of sham/placebo acupuncture. Another issue is whether the manipulation techniques used by the acupuncturist, and the number of needles inserted impact on analgesia in a manner similar to medication dosage [6,18]. All these factors present issues when assessing the effects of acupuncture and related therapies in cancer pain and may limit the extent to which meta-analyses approaches are appropriate.

Moreover, under the recent escalation in published systematic reviews (SRs) that evaluate the effectiveness of acupuncture for CRP, it is necessary to use the methods of the overview of SRs to summarize available evidence, appraise the evidence level, and give recommendations to future research and practice. Therefore, the purpose of this review was to summarize and evaluate the methodological quality of SRs and meta-analyses papers on the acupuncture and related therapies for management of CRP. Thus, this review helps in identifying research gaps that need to be addressed and develop a series of recommendations for improving the quality of future studies in this area.

2. Methods

2.1. Search strategy

A systematic search was carried out to identify SRs and/or meta-analyses of acupuncture and related therapies for CRP, using MEDLINE, EMBASE, the Cochrane Database of Systematic Review, and PubMed from their inception through March 2018. Search terms included: acupuncture, cancer-related pain, and patients with cancer. The terms of “systematic review” and “meta-analyses” were used as the filters.

2.2. Inclusion criteria

Two forms of inclusion criteria were established. The first criterion (criterion A) is applied to all SRs and/or meta-analyses of the effects of acupuncture and related therapies on CRP. The second criterion (criterion B) is applied to SRs and meta-analyses that have been assessed as “formulating conclusions appropriately” and “combing the findings of studies appropriately.” SRs and meta-analyses that met criterion A were assessed for the methodological quality using Assessing the Methodological Quality of Systematic Reviews (AMSTAR); SRs and meta-analyses that met criterion B, data were extracted to summarize the finding of this review.

2.2.1. Criterion A

In terms of participants, the SRs had to include clinical trials that involved adult patients with a diagnosis of cancer, regardless of cancer types. For intervention group, any forms of acupuncture and related therapies regardless of needling techniques and stimulation method were considered in this review, including manual acupuncture, electro-acupuncture, ear acupuncture, acupressure, moxibustion, TENS and combinations of these. For comparison groups, authors include sham/placebo acupuncture, analgesic administration, and no additional intervention to usual care.

In terms of outcomes, the SRs had reported pain intensity measured using a visual analogue scale, numerical rating scale or other validated outcome measures were included. In addition, SRs that had primary studies measured pain intensity immediately less than or equal to 30 min post acupuncture were included. This is based upon 15–30 min being the recognized time required until onset of acupuncture alleviating effects [19,20]. Furthermore, this study included SRs examining primary studies using “multiple time measurements of pain” after acupuncture completion, with multiple measurements aimed at assessing immediate, lasting, and delayed effects after therapy [21].

2.2.2. Criterion B

It is applied to SRs and meta-analyses that have been assessed as “formulating conclusions appropriately” and “combing the findings of studies appropriately” according to questions 8 and 9 in AMSTAR. For the SRs and meta-analyses, which met criterion B were summarized the findings of each SRs as the effectiveness of acupuncture and related therapies for management of CRP.

2.3. Screening and selection of systematic reviews

There is diversity in the methods used to assess the quality of SRs, and none has become entirely accepted [22]. Although some researchers recommended one reviewer to screen titles and abstracts for potentially inclusion [23]. However, our approach in this study was stricter and cautious. The two authors (AH and AM) screened all hits independently based on the titles and abstracts. All articles that met the inclusion criteria were selected for the next stage. Then, the authors independently examined full-text articles according to the inclusion criteria; any difference was discussion. Consensus between the two authors was essential. Articles that clearly did not meet all the criteria were excluded, and duplicate articles were removed.

2.4. Quality assessment of included reviews

Two authors (AH and AM) used AMSTAR to assess the methodological quality of SRs [24], as studies showed that it has satisfactory inter-observer agreement, reliability, and construct validity [25,26]. AMSTAR contains 11 items to assess the degree to which the design and execution of a SR are methodologically sound and unbiased. Each item is categorized into a standardized set of four possible responses: yes, no, cannot answer, or not applicable. The review process involved the following: items relate to a-priori design, study selection and data extraction, comprehensiveness of the search strategy, search of grey literature or unpublished literature for eligible studies (dissertations, conference proceedings, and trial registries are all considered grey for this purpose [27])reporting of included and excluded studies, presentation of study characteristics, conduct of risk of bias assessment, appropriateness of methods used to synthesize study findings, formulation of conclusions considering the overall quality of evidence, publication bias and conflict of interest assessments.

2.5. Data extraction and analyses

Two authors (AH and AM) independently extracted data from each SR using an electronic form that was developed for this review. All extracted data were checked for consistency, and any differences were resolved by discussion. The authors extracted the characteristics of included SRs including the basic characteristics such as authors' name, design, publication years, and number of included trials as well as specific details of the participants, interventions, comparison groups,