Pilot study of Iyengar yoga for management of aromatase inhibitor-associated arthralgia in women with breast cancer

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Dear Editor,

Aromatase inhibitors (AIs) are used routinely as part of adjuvant therapy for postmenopausal women with estrogen receptor positive breast cancer. Although beneficial, AIs are not without side effects. In addition to increased risk of osteoporosis and bone fracture, their use is associated with an arthralgia syndrome characterized by joint pain and stiffness. Other common symptoms attributed to AIs include fatigue, sleep problems, hot flashes, and mood disturbance. There has been limited research, to date, on treatment of AI-associated arthralgia as demonstrated by the lack of evidence-based clinical practice guidelines for its management.

The possibility of relieving AI-associated joint pain with yoga has drawn attention. Initial supportive evidence comes from a randomized trial of yoga for 37 early stage breast cancer patients experiencing hot flashes that included 22 women prescribed AIs [1]. Significant reductions in joint pain were reported post-intervention and three months later relative to a wait-list condition. Additional support comes from a trial focused on yoga for AI-associated joint pain [2]. Participants were 10 breast cancer patients who reported worst joint pain severity 3 on a 0–10 scale. In a single-arm study, significant improvements over time were evident on performance-based measures of balance and flexibility and patient-reported outcomes (PROs) of perceived disability, pain severity, and quality of life.

This study sought to gather additional preliminary data about the acceptability, feasibility, and potential efficacy of yoga for relief of AI-associated joint pain and to address the lack in the previous single-arm study of PROs assessing other common symptoms attributable to AIs.

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Methods

Participants

Inclusion criteria were: 18 years of age; post-menopausal; English-speaking; diagnosed with stage 0–III breast cancer; completed chemotherapy and/or radiotherapy (as applicable) >1 month previously; prescribed an AI by a Moffitt Cancer Center (MCC) physician; report joint pain that started or worsened after AI initiation; and report worst pain in the past week 4 on a 0–10 scale. Exclusion criteria were: another form of cancer diagnosed in past 5 years; uncontrolled cardiac, pulmonary, or infectious disease; BMI >40 kg/m²; currently attending yoga classes; joint pain due to inflammatory arthritic condition; surgery in past 3 months; and currently taking corticosteroids or opioids.

Design and procedures

The study was approved by Liberty IRB, an independent institutional review board. The study coordinator reviewed medical records and met patients potentially eligible during scheduled outpatient visits or contacted them by telephone to confirm eligibility and explain the study. Individuals eligible and interested reviewed a paper or online informed consent form with the coordinator. Those choosing to participate then completed a baseline assessment before the intervention started. A post-intervention assessment was conducted within 1 week of the last intervention session.

Yoga intervention

Iyengar yoga classes were held at MCC for 90 min twice weekly for 12 weeks (total of 24 classes) specifically for study participants. Classes were led by two certified Iyengar yoga instructors under the supervision of a senior teacher. Iyengar yoga is a traditional form of Hatha yoga that can be tailored for different medical conditions and symptoms [3]. Participants were assisted in adopting a sequence of poses and using breathing techniques selected by the teacher and instructors. Sequences included standing poses, forward extensions, inversions, backbends, and twists. Assistance could include ad hoc props (e.g. blocks, blankets) as required individually. Participants started with simple versions and progressed to more advanced versions over the course of the intervention. They were instructed not to practice outside of class.

Outcome measures

Participants completed the following at the baseline and post-intervention assessments: Brief Pain Inventory-Short Form [4]; Western Ontario and McMaster Universities Osteoarthritis Index (WOMAC) and Australian/Canadian Hand Osteoarthritis Index (AUSCAN) [5], Fatigue Symptom Inventory (FSI) [6], Hot Flash Related Daily Interference Scale (HFRDIS) [7], Center for Epidemiologic Studies Depression Scale (CES-D) [8], and Insomnia Severity Index (ISI) [9]. To evaluate magnitude of change over time, paired *t*-tests were conducted comparing baseline and post-intervention values, and effect sizes (*d*_z) were computed. Patients also rated perceived helpfulness of the intervention at the post-intervention assessment.

Results

Forty-nine patients were eligible and asked to participate. Thirty declined (mostly because class time or location was not convenient), 16 provided written informed consent, and 3 verbally agreed and were waitlisted to ensure desired class size of 12 was achieved (39%). Of those consented, 3 were found to be ineligible and 1 withdrew before baseline assessment. Of those who completed a baseline assessment, 1 became ineligible and 1 did not complete the postintervention assessment (17%). See Table 1 for information about the remaining 10 participants. The mean number of the 24 classes attended was 13.8 (58%), and the median was 13 (54%), with a range of 6–20.

As shown in Table 2, significant ($p<.05$) reductions occurred for hand stiffness (AUSCAN), knee/hip pain, stiffness and impaired function (WOMAC), overall pain severity and interference (BPI), fatigue severity (FSI), and hot flash-related distress (HFRDIS). Reductions in hand pain and impaired function (AUSCAN), depressive symptomatology (CES-D), fatigue interference (FSI), or insomnia (ISI) were not significant. Finally, 70% rated the yoga classes ‘very’ or ‘extremely’ helpful in improving pain and 100% would recommend the classes to other women with AI-associated pain. No intervention-related safety issues were encountered.

Discussion

Results support the acceptability, feasibility, and potential efficacy of this intervention and provide direction for future research. With regard to acceptability, we observed that 39% of eligible patients agreed to participate. The main reasons for declining participation were largely related to convenience (i.e. class time and location). One way to address this issue in future research would be to use a decentralized format whereby participants are directed to yoga classes held in the community by certified instructors trained to follow a standard protocol. Another way would be to develop an approach in which participants transition to home-based yoga classes provided by instructors using widely available videotelephony applications (e.g. FaceTime via iPads) after initial in-person classes. With regard to feasibility, we observed that 83% of participants who completed a baseline assessment completed the post-intervention assessment and that no safety issues were encountered. The observed 58% class attendance rate is low; however, nonattendance generally reflected competing family and work demands rather than lack of desire to attend classes. A decentralized or Internet-assisted delivery format could also help to boost attendance rates by allowing participants to attend classes at times and places more convenient for them.

With regard to efficacy, we observed significant reductions in hand stiffness, knee/hip stiffness, pain and impaired function, and overall pain that are close to or exceed a large effect size (.80) [10]. Beneficial effects were also seen for fatigue and hot flashes, two other symptoms commonly reported by patients taking AIs. These results are corroborated by the high percentages of patients who perceived the intervention to be helpful in relieving their joint pain (70%) and would recommend it to others with joint pain (100%).

In summary, results support conducting a more definitive trial of yoga for AI-associated arthralgia and suggest ways to modify intervention delivery so as to facilitate greater participation and attendance at yoga classes.

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Key points

- Arthralgia is a common and disabling side effect of AIs used to treat breast cancer.
- There are currently no evidenced-based guidelines for management of AI-associated arthralgia; however, the possible benefits of yoga have attracted attention.
- This study demonstrated that yoga is acceptable, feasible, and potentially efficacious for addressing AI-associated joint pain.
- Findings support conducting a full-scale randomized trial to definitively evaluate benefits of yoga for AI-associated pain.

Table 1Participant characteristics ($N = 10$)

Variable	
Age, years: M (SD)	60.89 (9.79)
Race: White	8
Ethnicity: non-Hispanic	10
Marital status: married	6
Disease stage	
I	7
II	2
III	1
Surgery	
Mastectomy	7
Lumpectomy	3
Radiation: yes	5
Chemotherapy: yes	2
AI type	
Letrozole	1
Femera	9
AI treatment duration, years: M (SD)	2.09 (1.56)

Table 2Outcome comparisons ($N = 10$)

	Baseline	Post- intervention	Paired <i>t</i> -test	Effect size
Measure	<i>M</i> (<i>SD</i>)	<i>M</i> (<i>SD</i>)	<i>p</i>	<i>d_z</i>
AUSCAN Pain	16.50 (12.20)	13.50 (6.35)	.352	.31
AUSCAN Stiffness	5.10 (3.21)	2.90 (1.60)	.009	1.05
AUSCAN Function	30.40 (21.53)	24.80 (17.86)	.135	.52
WOMAC Pain	19.20 (12.25)	11.90 (7.09)	.048	.72
WOMAC Stiffness	11.00 (4.11)	6.00 (2.16)	.003	1.31
WOMAC Function	64.60 (38.07)	42.50 (22.14)	.050	.71
BPI severity	2.80 (2.01)	1.45 (1.22)	.015	.95
BPI interference	3.09 (2.39)	1.51 (1.83)	.033	.80
FSI severity	4.40 (2.57)	2.58 (2.11)	.037	.77
FSI interference	2.73 (1.99)	1.76 (1.74)	.142	.51
HFRDIS	27.20 (23.51)	11.20 (12.73)	.016	.93
CES-D	12.20 (6.30)	9.10 (9.12)	.191	.45
ISI	10.70 (7.30)	9.10 (7.65)	.190	.45