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Research

Some physiotherapy treatments may relieve menstrual pain in women with primary dysmenorrhea: a systematic review

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KEY WORDS

Primary dysmenorrhea
Dysmenorrhea
Physical therapy modalities
Systematic review

ABSTRACT

Question: In women with primary dysmenorrhoea, what is the effect of physiotherapeutic interventions compared to control (either no treatment or placebo/sham) on pain and quality of life? **Design:** Systematic review of randomised trials with meta-analysis. **Participants:** Women with primary dysmenorrhea. **Intervention:** Any form of physiotherapy treatment. **Outcome measures:** The primary outcome was menstrual pain intensity and the secondary outcome was quality of life. **Results:** The search yielded 222 citations. Of these, 11 were eligible randomised trials and were included in the review. Meta-analysis revealed statistically significant reductions in pain severity on a 0–10 scale from acupuncture (weighted mean difference 2.3, 95% CI 1.6 to 2.9) and acupressure (weighted mean difference 1.4, 95% CI 0.8 to 1.9), when compared to a control group receiving no treatment. However, these are likely to be placebo effects because when the control groups in acupuncture/acupressure trials received a sham instead of no treatment, pain severity did not significantly differ between the groups. Significant reductions in pain intensity on a 0–10 scale were noted in individual trials of heat (by 1.8, 95% CI 0.9 to 2.7), transcutaneous electrical nerve stimulation (2.3, 95% CI 0.03 to 4.2), and yoga (3.2, 95% CI 2.2 to 4.2). Meta-analysis of two trials of spinal manipulation showed no significant reduction in pain. None of the included studies measured quality of life. **Conclusion:** Physiotherapists could consider using heat, transcutaneous electrical nerve stimulation, and yoga in the management of primary dysmenorrhea. While benefits were also identified for acupuncture and acupressure in no-treatment controlled trials, the absence of significant effects in sham-controlled trials suggests these effects are mainly attributable to placebo effects. **[Kannan P, Claydon LS (2014) Some physiotherapy treatments may relieve menstrual pain in women with primary dysmenorrhea: a systematic review. *Journal of Physiotherapy* 60: 13–21]**

Introduction

Primary dysmenorrhoea is defined as cramping pain in the lower abdomen that occurs just before or during menstruation without identifiable pelvic pathology.[1] Secondary associated symptoms include nausea, vomiting, fatigue, back pain, headaches, dizziness, and diarrhoea.[2] Primary dysmenorrhoea has been reported as the leading cause of recurrent absenteeism from school or work in adolescent girls and young women, and is considered to be a common disorder among women of reproductive age.[3] A survey of 1266 female university students found the total prevalence of primary dysmenorrhoea to be 88%, with 45% of females having painful menstruation in each menstrual period and 43% of females having some painful menstrual periods.[4]

Excessive production and release of prostaglandins during menstruation by the endometrium causes hyper-contractility of the uterus, leading to uterine hypoxia and ischaemia, which are believed to cause the pain and cramps in primary dysmenorrhoea.[3] Based on this understanding, pharmacological therapies for primary dysmenorrhoea focus on alleviating menstrual pain and relaxing the uterine muscles by using non-steroidal anti-inflammatory drugs (NSAIDs) or oral contraceptive pills.[5] A survey of 560 female students from three medical colleges in India reported that 87% of those with dysmenorrhea also sought treatment.[6] Among the women who sought treatment, 73% took analgesics and 58% had physiotherapy management, primarily heat treatment. Managing dysmenorrhea with NSAIDs and oral contraceptives is reported to be associated with side effects such as nausea, breast tenderness, intermenstrual bleeding, and hearing and visual disturbances[7] and in about 20 to 25% of women, menstrual pain has been shown to be inadequately controlled by NSAIDs alone.[8] Therefore, finding an effective non-pharmacological method for relieving symptoms of primary dysmenorrhoea has a significant potential value.

Non-pharmacological, non-invasive, and minimally invasive interventions that have been proposed for obtaining relief from

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dysmenorrhea symptoms include acupuncture and acupressure, biofeedback, heat treatments, transcutaneous electrical nerve stimulation (TENS), and relaxation techniques.[7] Systematic reviews and meta-analyses have been conducted to determine the efficacy of individual physiotherapy interventions on primary dysmenorrhoea. In 2009, a systematic review of trials of TENS reported that high-frequency TENS was effective for the treatment of primary dysmenorrhoea.[9] In 2009, a Cochrane systematic review evaluated three randomised trials on spinal manipulation and concluded that there was no evidence to suggest that spinal manipulation was effective.[10] In 2008, a systematic review of randomised trials of acupressure for primary dysmenorrhoea concluded that acupressure alleviates menstrual pain.[11] Though many reviews have evaluated the efficacy of individual physiotherapy interventions for primary dysmenorrhoea, to our knowledge no reviews have been done to determine the efficacy of physiotherapy modalities in the management of pain and quality of life in primary dysmenorrhoea. In addition, these reviews require updating because new trials of acupressure, acupuncture, and yoga have been published since 2010. Therefore, the research question for this systematic review was:

> In women with primary dysmenorrhea, do physiotherapy interventions reduce pain and improve quality of life compared to a control condition of either no treatment or a placebo/sham?

Methods

Identification and selection of studies

A search of the electronic databases CINAHL, PEDro, EMBASE, Web of Science, Ovid Medline, and AMED was conducted. The publication period searched was from database inception to June 2012. The search strategy for each database is presented in Appendix 1 of the eAddenda. No additional manual searches were performed. Two reviewers independently applied the inclusion criteria presented in Box 1 to all the retrieved studies, and any that clearly did not fulfil these criteria were excluded. If there was any uncertainty regarding the eligibility of the study from the title and abstract, the full text was retrieved and assessed for eligibility. The full text version of all included trials was used for data extraction and methodological quality assessment independently by both the authors. Disagreements were resolved by discussion between the reviewers until consensus was reached. The authors were contacted for any missing data in the included studies.

Box 1. Inclusion criteria.

Design
- Randomised controlled trials

Participants
- Women with primary dysmenorrhea

Interventions
- Acupuncture and acupressure
- Manual therapy, including spinal manipulation
- Electrotherapy, including transcutaneous electrical nerve stimulation
- Massage
- Therapeutic exercise

Outcome measures
- Primary: pain intensity as measured by the VAS and NRS
- Secondary: quality of life

Comparisons
- Physiotherapy intervention versus no treatment
- Physiotherapy intervention versus placebo or sham control

Assessment of characteristics of trials

Quality

The methodological quality of each included trial was assessed by two independent reviewers using the PEDro scale. Trials were not excluded on the basis of quality, although quality was taken into account when interpreting the results. Each item on the scale was scored as either 'yes' or 'no' and the number of items scored as 'yes' (excluding the first item, which relates to external validity) was summed to give a total score out of 10. Trials scoring six or more were considered to be of high quality and trials scoring five or less were considered to be of low quality.

For rating the quality of the evidence, the grading of recommendations assessment, development, and evaluation (GRADE) approach was used. According to this system, the quality of evidence is assessed by rating the outcomes of the trials included in the review. The quality is then categorised as 'high,' 'moderate,' 'low,' or 'very low'.[12] Evidence based on randomised trials begins as high-quality evidence and is downgraded for the following reasons: limitations in conduct and analysis (ie, *risk of bias*) of the studies; *imprecision* of the summary of the estimate of effect; *inconsistency* of the results across the available studies; *indirectness* or poor applicability of the evidence with respect to the populations, interventions, and settings where the proposed intervention may be used;[12] and evidence of *publication bias*.

Downgrading for *risk of bias* could occur for: lack of allocation concealment; non-blinding of participants, personnel, and outcome assessors; incomplete outcome data; selective outcome reporting; or other sources of bias.[13] Non-blinding of participants and therapists was considered to be a major limitation and also resulted in downgrading. In studies with self-reported outcomes, lack of assessor blinding was considered to be a minor limitation and was not downgraded. For judging *precision*, the clinical decision threshold boundary for absolute difference was set at 1%. If this boundary was met, imprecision was not downgraded. If the absolute size excluded this boundary and if the sample size was small, imprecision was downgraded.[14] To inform this decision, the optimum information size was calculated to be 26 in each group, assuming α of 0.05 and β of 0.02. The difference in means between groups was taken as 1.4 cm, based on previous studies. If assessment of *consistency* of results indicated heterogeneity between studies, random-effects models were used for meta-analysis where appropriate. When judging *directness*, studies were downgraded if patients or interventions differed from those of interest.[15] Evidence was rated down for *publication bias* if the individual trials were commercially funded.[16] The overall quality of evidence was then based on the lowest quality rating for the outcome.[17]

Design

Only randomised trials were eligible, including crossover trials if outcome data were available for each intervention prior to the crossover. Studies published in languages other than English and Swedish were excluded.

Participants

The age and pain severity of the participants with primary dysmenorrhoea were recorded to describe the trials. Trials involving participants with secondary dysmenorrhoea, that is, individuals with an identifiable pelvic pathology or chronic pelvic pain, were excluded.

Interventions

Trials that compared different forms of the same treatment (eg, different modes of TENS) were excluded. The effect of physiotherapy had to be distinguishable from the effects of other treatment. For example, where participants were permitted to take analgesics