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ARTICLE

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M. Y. Li, C. W. Kan, A. S. W. Wong, Y. L. Kwok, J. Yip, S. P. Ng and T. H. T. Lao

Full Length Research Paper

Effectiveness of physical therapy for pregnant low back pain - A literature review

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This study aims to review recently published clinical presentation on the effectiveness and impact of current therapy for low back pain (LBP) during pregnancy. This would help to build an information background and determine the necessity for future research on the development of an effective means for reducing pregnant low back pain.

Key words: Therapy, pregnant, low back pain, review.

INTRODUCTION

About 50 to 70% of pregnant women have experienced some form of low back pain (LBP) during pregnancy, pregnancy-related low back pain (PLBP) and/or pregnancy related pelvic girdle pain (PPGP) (Berg et al., 1988; Mogren and Pohjanen, 2005; Ostgaard et al., 1991; Wang et al., 2004). Typically, the pain is located in the sacroiliac area (Ostgaard et al., 1991; MacEville and Buggy, 1996). There is a large range of pain relief strategies and therapeutic therapy for pregnant low back pain (Ho et al., 2009). This study aims to review recent clinical presentation investigating the effectiveness of different therapy.

METHODOLOGY

Literature search was performed in May, 2013 to obtain recently

published research articles studying the effectiveness of different therapy to relief pregnant low back pain. Databases searched were: CINAHL database (1982+) and MEDLINE (1946+) via OVIDSP. Advanced search was used. The keywords used include low back pain, pelvic pain combined with pregnant, pregnancy, treatment and therapy. Google was used to further explore obtained web links from the databases. Reference list of retrieved articles were also scanned for additional relevant articles.

In order to review recent research to provide a more up-to-date information on the background, studies were scanned and those which were published before 2000 were excluded in this review. Case study and review articles and studies which were not relating to the therapeutic treatment for PLBP were excluded. Inclusion criteria were original research and reviews related to therapeutic treatment for PLBP, clinical trial or pilot study on any type of therapy for pregnant low back pain and articles published in English language with full text.

The literature search generated 233 results, 52 of them from CINAHL, and 181 of them from MEDLINE. All titles and abstracts

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were reviewed. Forty-four (44) were excluded due to duplication and 173 were excluded due to not fulfilling inclusion criteria. Three (3) were added from hand searching of the reference lists of eligible articles. Figure 1 shows the summary of study selection process. After reviewing all the selected studies, it was observed that recent therapy for reducing low back pain can be categorized into three main groups: (i) maternity support belts or binders, (ii) acupuncture and (iii) water aerobics and exercises. Their effect on pregnancy-related low back pain have been researched as a preventive or therapeutic treatment to manage or reduce pregnant LBP. The selected studies are summarised in Table 1.

Significance of this study

This review provides general understanding of recent physical therapies for the relief of low back pain during pregnancy and their effectiveness. The results contribute to the field with a more up-to-date information which can help healthcare professionals to provide advice with evidence to pregnant women who suffered in low back pain.

DISCUSSION

Maternity support garment

Among the four categories of maternity support garment (belts, briefs, cradles and torso supports) (Ho et al., 2009), research data was found only for the effectiveness of belts to reduce pregnant LBP, no studies have investigated the effectiveness of the other three types of maternity support garments. The effect of reducing pregnant LBP by maternity support belt has been examined and proven (Kalus et al., 2008; Nilsson-Wikmar et al., 2005; Carr, 2003). Maternity support belts are regarded as a safe, low cost and accessible device (Carr, 2003) and have been recommended for the management of lumbar spine and/or pelvic pain symptoms (Borgstein et al., 2005; Balik et al., 2014; Ritchie, 2003; Perkins et al., 1998). The belt application is shown to have a mechanical effect of reducing the mobility, laxity and sagittal rotation of the sacroiliac joints in healthy women and in women with pregnancy-related pelvic girdle pain (Damen et al., 2002; Mens et al., 2006; Vleeming et al., 1992). The pelvic belt was found to cause a significant decrease in the sagittal rotation in the sacroiliac joints (Vleeming et al., 1992). It was found that sacroiliac joint laxity was significantly reduced when the belt was worn in a high position (just below the anterior superior iliac spines) rather than in a low position (at the level of the symphysis) (Damen et al., 2002). In another similar study, sacroiliac joint laxity was significantly decreased in both high and low belt positions, compared to that in no-belt condition. The belt application in the high position decreased the sacroiliac joint laxity to a significantly greater degree than that in the low position (Mens et al., 2006). These prove the use of a support belt may improve lumbo-pelvic stability. The hypothesis is that the support may either press the articular surfaces of

sacroiliac joint together and/or it may place the sacroiliac joint in an extreme position to provide stability (Ho et al., 2009). Although the results of most studies support that the maternity belt effectively reduces pregnant low back pain, however, there is study reported that the use of maternity belt has no additional effect. The researcher has evaluated the effect of combined treatment of maternity belt with other therapy. The study shows that there is reduction in pain, however, there were no statistically significant differences between groups (that is, the use of maternity support belt did not add effect to other treatment) (Haugland et al., 2006).

Acupuncture

The effectiveness of acupuncture was investigated and reported that it relieved pain without serious adverse effects in late pregnancy (Elden et al., 2008; Elden et al., 2005; Wedenberg et al., 2000; Kvorning et al., 2004). Research suggests that it may be advantageous to begin acupuncture therapy later in pregnancy to maximize pain relief (Ekdahl and Petersson, 2010). However, another finding showed that acupuncture had no significant effect on pain or on the degree of sick leave compared with non-penetrating sham acupuncture (Elden et al., 2008). Therefore, the efficiency of reducing pregnant LBP by acupuncture remains inconclusive. Researcher also compared the effect of acupuncture in the treatment of LBP in comparison with physiotherapy (Elden et al., 2005; Wedenberg et al., 2000). A researcher found that both acupuncture and stabilising exercises constitute efficient complements to standard treatment for the management of pelvic girdle pain during pregnancy, while acupuncture is superior to stabilising exercise stabilising exercises (Elden et al., 2005). Results from another study show that the mean visual analogue scale values in the acupuncture group were significantly lower both in comparison with the values before treatment and in comparison with the values of the physiotherapy group.

Exercise and water aerobics

A common treatment of LBP is physiotherapy. There are evidences shown that exercise and water aerobics are effective means to prevent or reduce pregnant LBP. Researchers have reviewed the effect of exercise on pregnant LBP (Elden et al., 2005; Depledge et al., 2005; Nilsson-Wikmar et al., 2005; Nascimento et al., 2012; Richards et al., 2012). They found evidence to support exercise as an effective means to improve functional outcomes. Researcher examined the effect of home exercise and clinic group exercise, and there is no significance difference between them (Nilsson-Wikmar et al., 2005). Research also showed that counseling and physical training may alleviate LBP and decrease the

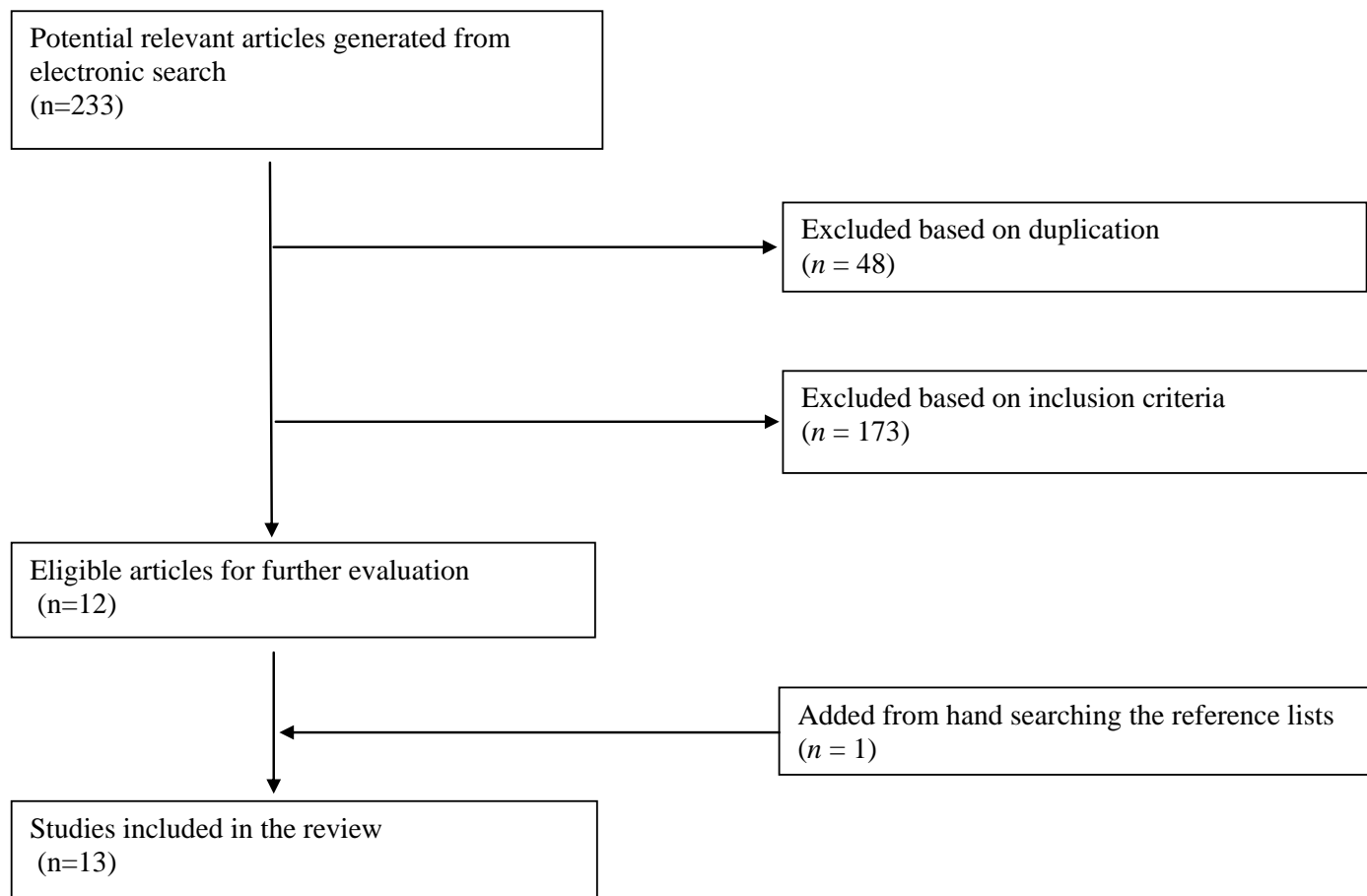


Figure 1. Summary of study selection process.

need for sick leave. Water aerobics is also found to diminish sick leave and it is concluded that it can be recommended to pregnant women (Granath et al., 2006). Previous research supported that water gymnastics has recently been reported to reduce the intensity of LBP in pregnant women (Kihlstrand et al., 1999).

Study limitation

The study aims to review the recent research on physical therapy to reduce pregnant low back pain; therefore only studies published after 2000 were included. The exclusion of previous studies limited the representative of the results concluded in this study.

Conclusion

In this review paper, publications related to the effectiveness and impact of current therapy for low back pain during pregnancy were reviewed and it was observed

that recent therapy for reducing low back pain could be categorized into three main groups: (i) maternity support belts or binders, (ii) acupuncture, and (iii) water aerobics and exercises. After reviewing these clinical studies, it was found that the therapeutic effects of maternity support garments and acupuncture cannot be concluded. More research data is necessary before their effectiveness can be confirmed. Future research should evaluate both the independent effect and combined effect with other treatment of them in order to develop of an effective means for reducing pregnant low back pain.

Conflict of Interests

The authors have not declared any conflict of interests.

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Table 1. Selected studies from literature review.

References	Year	Design and Setting	(n)	Participants	Groups	Description	Findings
Ekdahl and Petersson (2010)	2010	Intervention study	40	Healthy pregnant women presenting with low back and pelvic pain at maternity health care centers.	Group 1: gestational week 20 Group 2: gestational week 26	Women received acupuncture treatment from gestational week 20 or week 26 respectively, for a period of 6 weeks divided into eight sessions of 30 minutes each.	It may be advantageous to begin acupuncture therapy later in pregnancy to maximize pain relief.
Elden et al. (2008)	2008	Randomised double-blinded controlled trial. East Hospital, Gothenburg, and 25 antenatal primary careunits in Sweden.	115	Healthy acupuncture-naive pregnant women with singleton fetuses at 12–29 completed gestational weeks that experienced evening pain	Group 1: standard treatment plus acupuncture Group 2: standard treatment plus non-penetrating sham acupuncture	In the acupuncture group, sterilized disposable needles were used. In the non-penetrating sham acupuncture group, participants received a sham acupuncture device	Acupuncture had no significant effect on pain or on the degree of sick leave compared with non-penetrating sham acupuncture.
Mårtensson et al. (2008)	2008	prospective, randomised, controlled trial	128	Pregnant women with 37-42 gestational weeks and spontaneous onset of labor pain with a frequency of 3 contractions during 10 min	Acupuncture Group (n=62) Sterile water injections Group (n=66).	The acupuncture group was treated at GV20, LI4 and SP6 and depending on where the pain was perceived. The sterile water injection group was given 4-8 subcutaneous injections of 0.5 ml sterile water.	Women given sterile water injection experience less labor pain compared to women given acupuncture
Kalus et al. (2008)	2007-	Randomised controlled trial. A tertiary referral hospital in Australia	115	Women between 20 and 36 weeks of pregnancy with lumbar back or posterior pelvic pain	Treatment Group with BellyBra (n=55). Control Group with Tubigrip (n=60)	Participant completed a baseline questionnaire and a follow-up questionnaire at the completion of the 3-week study period on a return visit to the antenatal clinic.	The BellyBra was more effective than tubigrip in alleviating the impact of pain on a number of physical activities that constitute daily life.
Haugland et al. (2006)	2006	Randomized clinical study.	569	Pregnant women with pelvic pain between the 18th and 32nd week of gestation	intervention group (n=275) and control group (n=285)	Intervention group participated in an education program that consisted of information, ergonomics, exercises, pain management, advice for daily life movement, pelvic belt/crutches, and information about delivery. Control group was not offered any treatment, but were free to seek advice or other treatment.	Postpartum pelvic girdle pain improved with time both in the intervention group and the control group, but there were no statistically significant differences between the groups
Granath et al. (2006)	2006	Randomized controlled clinical trial. Three antenatal care centers.	390	Healthy pregnant women understanding Swedish	LBPE Group. Water aerobics Group	Weekly group interventions of 45 minutes activity followed by 15 minutes of relaxation for both.	Water aerobics has been shown to diminish sick leave and can be recommended to pregnant women.

Table 1. Cont'd.

Elden et al. (2005)	2005	Randomised single blind controlled trial.	386	Healthy women at 12-31 completed gestational weeks, well integrated in the Swedish language, with singleton fetuses and defined pregnancy related pelvic girdle pain.	Three groups	Standard treatment group: general information about the condition and anatomy of the back and pelvis and advices Acupuncture group: standard treatment and acupuncture. Stabilising exercises group: s standard treatment and stabilising exercises.	Acupuncture and stabilising exercises constitute efficient complements to standard treatment for the management of pelvic girdle pain during pregnancy. Acupuncture was superior to stabilising exercises in this study.
Depledge et al. (2005)	2005	Randomized masked prospective experimental clinical trial	87	Pregnant women with symphysis pubis dysfunction	Three groups, Pre and post test	Group A: Exercise and advice (n=30) Group B: Exercise, advice and a non rigid pelvic support belt (n=29) Group C: Exercise, advice and a rigid pelvic belt (n=28)	All three groups had significant reduction in pain. No significant differences were found between the groups. The use of pelvic support belt did not add to the effects provided by exercise and advice.
Nilsson-Wikmar et al. (2005)	2005	randomized assessor-blinded clinical trial	118	Pregnant women with pelvic girdle pain, between week 2-30	3 groups	Information Group: use of a nonelastic sacroiliac belt (n=40) Home Exercise Group: information with the addition of a home exercise program (n=41) Clinic Exercise Group: information plus participation in a training program (n=37).	There was no significant difference among the groups during pregnancy or at the follow-ups postpartum regarding pain and activity.
Carr (2003)	2003-	Prospective, two-group design with repeated measures	40	Pregnant women with low back pain, at least 20 weeks of gestation	Pre- and pro test	Control Group: (n=10) Treatment group: (n=30) maternity support binder.	The treatment group had significant reduction in mean pain scores and effect of pain on daily activities
Damen et al. (2002)	2002	Single group trial	10	Healthy women aged 18 to 30 years old	One group	The influence of pelvic belt at different position and tension was measured by Doppler imaging of vibrations.	A significant effect was found for the position of the pelvic belt but tension does not have a significant effect.
Wedenberg et al. (2000)	2000	Randomized controlled trial.	60	Pregnant women suffering from LBP with a gestational age of no more than 32 weeks	Acupuncture Group Physiotherapy Group	Questionnaires were completed before treatment, during treatment and after treatment for both.	Acupuncture relieved pain and diminished disability in low-back pain during pregnancy better than physiotherapy.

Table 1. Cont'd.

Mens et al. (2006)	2000	Randomized controlled study, Netherlands	44	Pregnant women with persistent pelvic pain	Three groups	(1) performed exercises to increase the force of the diagonal trunk muscle systems (2) received training of the longitudinal trunk muscle systems, (3) instructed to refrain from exercises.	Training of the diagonal trunk muscle systems, without individual coaching, has no additional value above instructions and use of a pelvic belt without exercises.
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