Exercise for Pain Relief in Yoga is Effective in Reducing Pelvic Girdle Pain During the Third Trimester of Pregnancy

Sri Sukamti¹, Aticeh¹, Gita Nirmala Sari¹

¹ Midwifery Department, Jakarta 3 Health Polytechnic, Ministry of Health, Indonesia

ABSTRACT

Background: Pelvic girdle pain (PGP) is one of the most common pelvic pains during pregnancy. PGP often occurs in pregnant women with an incidence of around 25 %. Several methods have been developed to relax muscles or ligaments that can alleviate pelvic pain.

Purpose: This study aimed to determine the effectiveness of exercise for pain relief in yoga in reducing pelvic girdle pain during the third trimester of pregnancy.

Methods: This was a non-randomized controlled experimental study of 50 pregnant women in the third trimester with pelvic pain. The study was conducted in an antenatal clinic that provides prenatal yoga class. The treatment group (25 pregnant women) was given prenatal yoga for 2 weeks and the control group was provided with regular prenatal care. The level of pain was measured using a visual analog scale (VAS) with score from 0 to 10 before and after 2 week-prenatal yoga was given.

Results: The level of pelvic pain was lower in the treatment group that was given prenatal yoga for pain relief. The mean value of pelvic pain before intervention was 4.36 and after intervention was 2.08. The two groups had different scores for pelvic pain (p value =0.000 and mean difference -2.28). There was a significant effect of prenatal yoga for pelvic pain relief on the intervention group. The mean difference was -2.130 (95% CIs=-2.583, -1.657), p value was 0.000.

Conclusion: Exercise for pain relief in yoga was effective in reducing pelvic girdle pain during the third trimester of pregnancy. Pregnant women with pelvic girdle pain may practice a combination of regular pregnancy exercise and prenatal yoga to lessen the pain.

Keywords: prenatal exercise, yoga, pelvic girdle pain, pregnancy

BACKGROUND

Pelvic girdle pain is a specific lower back pain existed between the iliac crests and the gluteal folds, and around the sacroiliac joints. The incidence of pelvic girdle pain (PGP) is 24-50% in pregnant women (Engeset et al., 2014a) and around 50% worldwide (Levac et al., 2012). Meanwhile, based on data from the Cochrane library about 1/5 of pregnant women have experienced pelvic pain (Liddle & Pennick, 2015). Many factors contribute to the cause of pelvic pain during pregnancy, including hormonal, biomechanical, genetic, metabolic, as well as degenerative factors (Dong et al., 2020; Hinobayashi et al., 2013).

A longitudinal study conducted in Sweden that involved 530 women with a history of PGP during pregnancy found that 10 percent of these women had long-term PGP (Elden et al., 2016). If not handled properly, it will affect the quality of daily life in the future. Pregnant women with PGP will more easily develop complications in the delivery process and have difficulty in performing the mother's role because they always feel uncomfortable in their pelvis (Dufour & Daniel, 2018). A cross sectional study of pregnant women in Iran revealed that 1 in 2 women in this study experienced PGP, with average pain intensity using visual analogue scale of 5.6 (Mousav et al., 2007). The high incidence of PGP in pregnant women requires great attention from health workers because the impact of PGP is quite significant. Long-term morbidity can be reduced by early diagnosis so that appropriate treatment can be provided.

The cause of pelvic pain is still unclear. Some studies found that the cause of this pain was related to hormonal and biomechanical factors (Stuge, 2012; Vleeming et al., 2008; Wang et al., 2004). The relaxing hormone combining with other hormones causes changes in the pelvic and other ligaments. If it is not treated with proper neuromotor control, it will cause pain.

The management of PGP is carried out with several suggestions for exercising during pregnancy, getting various kinds of information on how to prevent severe pain and understanding the causes of PGP to be able to avoid it (Engeset et al., 2014b). Yoga as an exercise is known to reduce pain and discomfort during pregnancy (Jiang et al., 2015; Sun et al., 2010). It is useful in alleviating pain during pregnancy and safe for pregnant women. Several studies have also shown that yoga is effective in reducing anxiety during pregnancy, depression, stress, back pain and sleep disorders (Hamdiah et al., 2017; Romano et al., 2010).

OBJECTIVE

This study aimed to determine the effectiveness of exercise for pain relief in yoga in reducing pelvic girdle pain during the third trimester of pregnancy

METHODS

This was a non-randomized controlled experimental study involving 50 pregnant women in the third trimester who experienced pelvic girdle pain with pain scale ≥ 4 and had no complications during the pregnancy period. The selected sample has met the inclusion criteria (pregnant women with a pain score using the visual analogue scale was ≥ 4 , had no risk factors in pregnancy, had routine antenatal care from the beginning and were willing to be research respondents) and exclusion criteria (did not do relaxation continuously and not achieving adequate exercise frequency). The sample was obtained using purposive sampling and divided into 2 groups: the treatment group consisting of 25 pregnant women who were given prenatal yoga for pain relief and the control group

comprising of 25 pregnant women who were provided with regular prenatal care. Both groups were measured on a pelvic girdle pain scale with a visual analogue display before and after 2 weeks of intervention. Visual analogue scale is a pain measurement tool that has been proven valid and reliable to measure pain by looking at a person's response to the pain compared to a questionnaire with multi-item questions (Boonstra et al., 2008; De Boer et al., 2004). The treatment group was previously trained to do prenatal yoga at a maternity home providing prenatal yoga class. Then they were asked to practice it individually at home at least 30 minutes a day, 3 times a week, for 2 weeks. Each respondent was monitored using an online messaging application to check compliance with doing yoga at home independently according to a schedule and a checklist form was provided for scheduled yoga practices. The correctness of carrying out the independent exercise process according to the instructions was entrusted to each respondent according to the informed consent that has been approved by the respondent at the beginning of the study in the second week. Both groups were reassessed using the same pelvic girdle pain measurement tool (visual analogue scale).

Dependent t test (paired t test) and independent t test (independent mean difference test) were performed to assess the difference in the mean of pelvic pain before and after the treatment group was given an intervention in the form of prenatal yoga for pain relief and before and after the control group was provided with regular prenatal care. The ethics committee of the Jakarta III Health Polytechnic has given approval to this study to use human subjects based on the letter No. KEPK-PKKJ3/031/IV/2017.

RESULTS

Of the 50 respondents who were divided into 2 groups (treatment group and control group), it was found that most women from both groups were pregnant for the first time (primigravida) (> 50%). Most of them had never had a child (76% in the treatment group and 56% in the control group). The mean age of respondents in the treatment group was 28 years, and in the control-group 29 years. The gestational age in both groups was above the average of 32 weeks.

Table 1. Respondent characteristics based on pregnant women with pelvic girdle pain

Variables	Total Number (n)	Intervention Group	Control Group
Age (years old), Mean	50	28.64	29.16
Gestational week (week), Mean	50	33.4	32.92
Gravida, n (%)	50	25	25
1. Primigravida		18 (72)	14 (56)
2. Multigravida		7 (28)	11 (44)
Parity, n (%)	50	25	25
1. 0		19 (76)	14 (56)
2. ≥ 1		6 (24)	11 (44)

Table 2. Level of pelvic girdle pain at the third trimester of pregnancy before and after intervention

Parameter	Treatment group				Control group			
	Mean	Min	Max	SD	Mean	Min	Max	SD
Pelvic pain score on initial examination	4,36	4	6	0,638	4,32	4	6	0,627
Pelvic pain scores after 2 weeks of intervention	2,08	1	4	0,909	4,20	3	5	0,707

Based on table 2, the average pelvic pain score before intervention in the treatment group was 4.36 and in the control group 4.32. After the intervention, the average pain score of the treatment group was 2.08 and the control group 4.20. The treatment group had a lower pain score than the control group after being given an intervention in the form of prenatal yoga for pain relief.

Table 3. Effect of exercise for pain relief in yoga on all pregnant women with pelvic girdle pain in the third trimester of pregnancy (n=50)

Parameter	Mean	Mean difference	SD	95% CIs	P value
Pelvic pain score at initial examination	4,34				
Pelvic pain scores after 2 weeks of intervention	3,14	-1,200	1,355	0,815 – 1,585	0,000

Table 3 shows the difference of pelvic pain scores before and after all respondents received intervention in the form of a combination of prenatal yoga and regular prenatal care (the mean is 4.34 and 3.14 respectively) (mean difference is 1.200). A combination of prenatal yoga for pain relief and regular prenatal care gave a significant effect that could lessen pelvic girdle pain in the third trimester of pregnancy ($p < .000$)

Table 4. The effectiveness of exercise for pain relief in yoga in reducing pelvic girdle pain during the third trimester of pregnancy

Pelvic girdle pain	Mean	Mean difference	SD	95% CI	P value
Treatment group	2,08	- 2,120	0,230	-2,583, -1,657	0.000
Control group	4,20				

Based on table 4, there was a significant reduction in pain before and after intervention in the treatment group compared to the control group. Statistically, prenatal yoga gave a significant effect in reducing pelvic girdle pain on pregnant women during the third trimester of pregnancy (mean different = -2.120, $p < .000$).

DISCUSSION

Our study examined the effectiveness of prenatal yoga in reducing pelvic girdle pain in a group of pregnant women. The results revealed that the treatment group that was given prenatal yoga showed a significant decrease in pelvic pain score compared to the control group that was only provided with regular prenatal care. Exercise for pain relief

in yoga proved to be more effective in reducing pelvic girdle pain compared to regular prenatal care.

The results of this study are consistent with a randomized controlled trial conducted in Brazil that involved 60 pregnant women with lumbopelvic pain. This trial found that the hatha yoga exercise was effective in reducing pain after 10 time-practice (Martín-García et al., 2020). In addition, a prospective randomized controlled pilot clinical trial involving 115 pregnant women without complications in Israel showed that yoga was safe for pregnant women without any adverse effects and it was able to improve biomechanics (gait speed, turn time, double support time and instrumented timed-up and go), so that it has the effect of reducing bodily discomfort due to pelvic pain (Holden et al., 2019).

Reports from literature review of 10 randomized controlled trial studies that have been evaluated state that yoga exercise is safe for pregnant women who are at high risk of developing or experience lower back pain during pregnancy ($p < 0.05$). Yoga is a more effective exercise than walking or standard prenatal exercise. Experimental research on 92 pregnant women who experienced depression and anxiety during pregnancy showed that yoga proved to be effective in reducing depression, anxiety, leg pain and back pain when practiced at least 20 minutes a day for 12 weeks ($p = 0.05$) (Ivanova et al., 2018). The results of these studies are consistent with the results of our study that prenatal yoga for pain relief was able to significantly reduce pelvic girdle pain when performed for 30 minutes a day.

Prenatal Yoga exercise may reduce pain related to several body mechanisms in the psycho-neural-endocrine regulatory system structure through the hypothalamus-pituitary-adrenal axis which rebalances the central nervous system (Campbel et al., 2014). In addition, yoga affects biomechanics of the body by lowering plasma concentrations of stress hormones (cortisol and catecholamines) (Field et al., 2013; Kamei & Toriumi, 2000; Martins & Pinto E Silva, 2014).

Our research has several advantages. It is an experimental study using standardized yoga training techniques. The number of samples used is considered to represent the minimum number of samples for intervention research. This study, however, also has some drawbacks. For example, respondents were practicing prenatal yoga only for 2 weeks, but this drawback was overcome by the frequency of doing yoga (at least 3 times a week). Besides that, monitoring yoga that is done by pregnant women at home is only done through an online message application and a list of forms that must be filled out by pregnant women every time when they do yoga exercises at home, so it is possible for pregnant women to do not according to standards that may occur.

CONCLUSION

Discomfort occurring during the third trimester of pregnancy, especially pelvic girdle pain (PGP), which is not due to trauma or symphiliosis, can be reduced by practicing prenatal yoga for pain relief 3 days a week for at least 2 weeks with duration of minimum 30 minutes per session. This exercise proves to be effective in lowering pelvic girdle pain score. Health workers, especially midwives, are expected to be able to make early detection as soon as possible on the possibility of pregnant women experiencing low back pain during pregnancy, so as not to cause chronic pain disorders that have a negative impact on the mother in the future.

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