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COMPARISON TRANSCUTANEOUS ELECTRICAL NERVE STIMULATION KINESIO TAPING AND DECREASING TO SCALE BACK PAIN IN PREGNANT WOMEN UNDER THIRD TRIMESTER IN PUBLIC HEALTH DISTRICT JUWIRING KLATEN, INDONESIA

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ABSTRACT

Background: *The changes of soft tissues and connective buffer that able to decrease elasticity and flexibility of muscles can cause low back pain in the third trimester of pregnancy. Dissemination percentage of pregnancy low back pain at first trimester (16.7%), second trimester (31.3%), and third trimester (53%). It can cause long term back pain and increase the trend of back pain in post-partum and chronic back pain that can be more difficult to be cured, if the back pain is not handled well immediately. Management of low back pain can be done both by pharmacologically and non-pharmacologically.*
Aims: *The present study aimed to compare the efficacy between transcutaneous electrical nerve stimulation (TENS) and Kinesio taping to the decreasing of low back pain on third trimester pregnant women in Public Health District Juwiring Klaten, Indonesia.*
Methods: *This research is a quasi-experimental research with non-equivalent design and pretest and posttest control group design. There were 18 postpartum, selected by purposive sampling method, and divided into 2 groups equally – intellect TENS and Kinesio taping "Spol Kinematics Tex" group. The therapy was done for 6 times (twice a week). The pain was measured by NRS scale. Data was then analyzed by Wilcoxon and Mann-Whitney test to find the mean differences.*
Result: *This research highlight that effectiveness of interact TENS to decrease low back pain on third trimester pregnant women then the application of Kinesio taping therapy (p value = 0,007)*
Conclusion: *Transcutaneous Electrical Nerve Stimulation is more efficient to reduce low back pain scale in third-trimester of pregnancy compared to Kinesio taping. This present study suggests a promotion of ergonomics in the form of counseling and poster display to the public, especially pregnant women to reduce low back pain patient. Further research with a larger number of subjects with pure experiment is necessary to avoid the subjectivity factor measurements using a pain scale plasma levels of endorphins.*

Keywords: *TENS, intellect TENS, Kinesio taping, "Spol Kinematics Tex", low back pain*

INTRODUCTION

Approximately 50 to 70% of pregnancy mother experience low back pain. The pain itself is related to: The age of pregnancy [1]. In the third trimester, the uterus expand bigger and the weight gain up which compel added stretch and tiredness on the body especially on back [2]. The pain also caused by hormonal changing that cause the soft tissue of buffer and connector decrease its elasticity and flexibility [3]. Prevalence of low back pain in third trimester is 53% [4].

Low back pain can cause negative impact on the living quality of pregnancy mother, like disturb the daily activity [5], like walking (40%), impaired sleep quality (58%), until need to leave from the work (10%) [6], If it does not get the right handling, can cause long-term LBP, increase back pain after birth and chronic back pain [7].

Many treatment of non-pharmacological which can decrease the medical medical interventions while experiencing lower back pain [8]. They are pregnancy exercise, yoga, often rest, exercise, warm compresses, Kinesio taping, massage, acupuncture, transcutaneous electrical nerve stimulation (TENS), aromatherapy, relaxation, and herbs. Some medications such as acetaminophen is also useful to decrease the number of LBP patient [6].

TENS therapy has proven to reduce various types of pain within 15-30 minutes. TENS is able to activate both large and small-diameter nerve that will deliver a variety of sensory information to the central nervous [9]. A research using 79 subject on third trimester showed that TENS with exercise is more effective and safety to decrease LBP on pregnancy [10].

Kinesio taping is good to increase range of motion, supporting joint function, activate the lymphatic system and endogenous analgesic system, improve microcirculation and the effects of muscle function. Kinesio taping relieved low back pain after the use of 2 to 3 days. Kinesio taping experiencing the peak effect after 24 hours of use and decreases its function after 4 days [11].

The number of pregnant women in Central Java province is 613.243 people [12], while the number of pregnant women in Klaten is 18.557 people [13], In Juwiring, there are 486 people of pregnant and 85 of 156 people of pregnant on the third trimester experience LBP. Based on the interview at Juwiring Public Health, 6 from 10 pregnancy mother on the third trimester had to experience LBP. The technique to reduce LBP there are posture correction, kinesio taping, and TENS. Based on the research before, the better way to know about electrotherapy deeper is using TENS [3]. Based on the background and issues above, the researchers wanted to investigate about the comparison between TENS and Kinesio taping on reducing the scale of low back pain in third-trimester of pregnancy at Juwiring Public Health, Klaten.

METHOD

This research is used Quasi-Experimental study design which is non-equivalent pretest and posttest control group design. Conducted at December, 25th 2015 until January, 30th 2016 at Juwiring Public Health, Klaten Yogyakarta, Indonesia. The sample of this research is third-trimester pregnant in Juwiring Public Health Klaten who experience low back pain with functional disorders daily, has no history of surgery in the spinal area, at least two times of Antenatal care, has not received therapy TENS or Kinesio taping is included. Mother who has the sensibility of the skin, there is a history heart disease and preeclampsia, wound lower back area, receiving analgesic drugs or inflammation and got physiotherapy treatment within the previous ten days is excluded. Subjects who did not obey the order declared null and void or drop out. Technique sampling which used in this research is Pocock formula [14], using sample from Mo-an, et-al [15], that are 9 people in each group and to anticipate dropping out, they added by 11 participant.

Data was taken at Juwiring public health, the subject is divided into 2 groups (TENS group and Kinesio taping group) and therapy is done for three weeks (twice in a week). The researcher using interview to and NRS to measure the intensity and quality of low back pain, the data was taken on pre and post therapy. With portable TENS which have two electrodes. Electrodes were attached to the skin of lower back and a distance of each electrode is 5cm, in this study used 120 Hz frequency and

100 microseconds of therapy. The skin should be clean and free of grease, lotion and cream, remove any metals in the area of therapy and do not stimulate the area directly.

Kinesio installed by Mechanical Functional Correlation, the researcher and physiotherapy fixing Kinesio at low back spinal area. Kinesio was installed when participants were standing out, so the low back becomes maximal flexion. Kinesio were cut 20 cm and slice it, so that make a Y-shaped. The strain of Kinesio attachment is not allowed on the beginning and end, but on the middle of kinesio, it was strain approximate 15-25% or 1-2 inches. This is use to stabilize the lumbo sacral ligament. Kinesio be replaced every three days by researcher or physiotherapy.

This research has done using NRS validity which indicates r = 90. NRS pain scale indicates the reliability of more than 0.95 [16] and test results Cohen's kappa for instruments NRS 0.86 [17]. Researcher used non-parametric test, and saphiro-test. The result shows that the data is not normal distribution, so that the researcher used Wilcoxon test to compare the average number of pregnancy mother with LBP and pregnancy mother without LBP. Furthermore, the researcher used Mann-Whitney test to compare after getting TENS treatment and Kinesio Taping. The researcher work together with physiotherapy in collecting the data and giving intervention on both control group for three weeks. This research has been permit from the ethic committee of STIKES 'Aisyiah Yogyakarta (now University Aisyiyah Yogyakarta). In addition to the ethical principles of research, researchers also made an informed consent given to the patient before the study has done and the researchers explain fully this study such as side effects or advantages.

RESULTS

The age subject between 20-35 years old. The most subject with 20-25 years old is 66.7%. All participant experienced low back pain. Pain duration with sub-acute category is 13 people (72.2%). Low back pain cause bending 11.1%, standing 16.7%, too long sitting 66.7%, not clear 5.6%. To reduce the pain by rubbing oil 33.3% and take a rest 66.7%.

Low back pain levels of subjects before and after the therapy group and the group Kinesio taping TENS:

1) Levels of low back pain before and after *TENS* therapy

Table 4.2 Distribution of subject level of back pain before and after TENS therapy (N=9)

Pain levels	Before						After					
	T1	**T2**	**T3**	**T4**	**T5**	**T6**	**T1**	**T2**	**T3**	**T4**	**T5**	**T6**
None	0	0	0	0	0	0	0	0	0	0	0	0
Low	0	0	0	0	2	7	0	0	0	2	7	9
Moderate	1	1	7	9	7	2	1	7	9	7	2	0
Severe	8	8	2	0	0	0	8	2	2	0	0	0

2) Levels of low back pain before and after *kinesio taping*

Table 4.3 Distribution of subject level of back pain before and after kinesio taping (N=9).

Levels of Pain	Before						After					
	T1	**T2**	**T3**	**T4**	**T5**	**T6**	**T1**	**T2**	**T3**	**T4**	**T5**	**T6**
None	0	0	0	0	0	0	0	0	0	0	0	0
Low	0	0	0	0	0	6	0	0	0	1	4	3

Moderate	1	2	4	9	9	3	2	4	7	8	5	6
Severe	8	7	5	0	0	0	7	5	2	0	0	0

Researcher used the Wilcoxon test (for normality test results are not normal distribution data) indicate that the therapeutic P_{value} from first sample to sixth is <0.05 which indicate no differences decrease lower back pain scale before and after therapy TENS in the third trimester pregnancy.

Researcher used the Wilcoxon test, which the P_{value} of therapy 1 is 0,157. There was no difference in scaling back low back pain before and after treatment. In the 2^{nd} treatment of Kinesio Taping and the 6^{th} therapy found the value of $p < 0.05$, so there was differences decrease low back pain scale before and after therapy but it was not significant in difference.

Researcher used the Mann-Whitney test, with this statistical test, showed Z-score value of -2.706 and P_{value} of 0.007. Based on these results it can be concluded that there was any differences decrease low back pain scale between TENS therapy and Kinesio taping.

DISCUSSION

The results showed all low back pain relief because it comes from the non-receptor skin layer cutaneous and sub-cutaneous, pain originate are usually easy to be allocated and defined. A delta receptor has the characteristics of pain dissipates, myelinated, the sensation of pain is sharp, precise and local sensation, pain threshold is relatively similar for everyone [18].

The category of sensitive subject before TENS therapy and Kinesio taping are in severe pain. This is in line with research carried out by the union of a neurologist throughout Indonesia (PERDOSSI) that was found 28.13% of back pain sufferers with an average value of pain are in moderate and severe pain [19]. Participant of this study is primigravid because there was usually have an excellent abdominal muscle because the muscle has never experienced a previous stretch [7].

The result was no significant difference was found in the fetal heartbeat [20]. Kvorning et al. (2004) in his study of low back pain in pregnancy with the results of TENS does not cause adverse effects there is a pregnant woman. There are no effects on the application of TENS for mothers and newborns [21].

The difference in rates of low back pain before and after TENS therapy at third-trimester of pregnancy

TENS group Statistical test results showed the P_{value} of the treatment 1^{st} to 6^{th} is <0.05 indicating no differences lower back pain scale before and after therapy TENS in third-trimester pregnant women. These results are consistent with research Keskin et al. [10] TENS is more efficient and safe for lower back pain in pregnancy.

TENS applied impulse is low (<10 Hz) the production of endorphins as a natural pain geared toward By the resulting reduction in pain can be slow but can reduce pain which lasted for several hours. TENS at high impulse (> 50 Hz) 'gates' pain will be closed, the effect of pain will soon subside, but not so long ago [22].

The difference in rates of low back pain before and after treatment at the Kinesio Taping third trimester of pregnancy.

Statistical analysis showed the p value in the treatment one is 0,157, so there is no difference in lower back pain scale before and after therapy.

Finding of Kinesio taping reduces low back pain is consistent with the results Paoloni et al [23], which observed the decrease in pain, as measured by VAS, after four weeks of treatment with

Kinesio taping. Although the mechanism of Kinesio taping is not clear yet, the notion that Kinesio taping apply the pressure on the skin and external loads that can stimulate the mechanoreceptors skin (myelinated nerve fibres) can thus inhibit the transmission of pain by the gate control theory [24].

The difference in rates of lor back pain third trimester of pregnancy between TENS therapy and Kinesio taping

Statistical test results showed the p value of 0.007 for the P_{value}<0.05 it means there are differences decrease lower back pain scale between the TENS and Kinesio taping. These results concluded that both treatments in the average value of a pain scale that is different, but TENS produces pain level lower than in the treatment of Kinesio taping it means that TENS is more effective to scale down his low back pain third-trimester of pregnancy compared with Kinesio taping.

In this study impulses of TENS used is 120 Hz then the pain will be closed through the nerves in the spinal cord are transmitted to the brain to produce natural endorphins that reduce pain "gate control Theory " but the effect of pain will soon subside, but not so long. The use of TENS in a period of more than two weeks will be more meaningful than when used in a short time.

The advantage of using TENS is that unlike eliminate pain with medication is not addictive, does not cause drowsiness or nausea, and can be done at any time as needed. However, the use of TENS therapy is now generally impractical because it requires specialize skills and knowledge to adapt existing programs on TENS therapy tool with complaints and the type of treatment desired. Consequently, tool TENS therapy is useful in medical rehabilitation and physiotherapy clinics.

The limitations of this research are the subjectivity factor, collecting data on the intensity of pain. However, it has been sought as much as possible to get good results by asking for help from others (Midwives, Physiotherapy) to perform measurements.

CONCLUSIONS AND RECOMMENDATIONS

Transcutaneous Electrical Nerve Stimulation is more efficient to reduce low back pain scale in third-trimester of pregnancy compared to Kinesio taping. This present study suggests a promotion of ergonomics in the form of counseling and poster display to the public, especially pregnant women to reduce low back pain patient. Further research with a larger number of subjects with pure experiment is necessary to avoid the subjectivity factor measurements using a pain scale plasma levels of endorphins.

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