

## THE EFFECTIVENESS COMPARISON BETWEEN MEFENAMIC ACID AND ACUPUNCTURE POINT OF SAN JIAO YIN (SP6) ON DYSMENORRHEA PAIN REDUCTION

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### ABSTRACT

**Background :** Dysmenorrhea was one of the most common gynecology complaints , especially in young women. This caused stomach pain or back pain or others uncomfortable feeling, at before, after or during menstruation which greatly affected the quality of life. Efforts reduced or eliminated pain usually use pharmacological or non-pharmacological treatments. Mefenamic acid is one of the pain and inflammation relievers. These drugs included non-steroidal anti-inflammatory drugs (NSAIDs) worked to inhibit swelling, pain, stiffness, and fever. Non-medical therapies such as acupuncture have been used to treat dysmenorrhea and have been recommended as non intervention pharmacology. The most commonly used acupuncture point in the treatment of dysmenorrhea was San Yin Jiao (SP6), which was the point on the Tai Yin meridian of the spleen.

**Materials and methods :** Mefenamic acid and acupuncture at the San Yin Jiao (SP6) points. The design of this study was a quasi experiment . The design used was non-randomized pretest-posttest control group design. The independent variable in this study was the use of mefenamic acid and the San Yin Jiao (SP6) acupuncture point was on the right leg calf and the dependent variable was the scale of pain using VAS. The sample used was 60 people.

**Results:** The Wilcoxon test showed that the treatment of pain with mefenamic acid and acupuncture all decreased significantly. The average decline in the mefenamic acid group was 1.5 and in the acupuncture group it was 1.4. These results indicated the handling of pain using both mefenamic acid and acupuncture werej significantly reduced pain. The handling of menstrual pain between mefenamic acid and acupuncture showed a very small difference of only 0.01 in the Man Whitney test. These results indicated that the treatment of menstrual pain between both mefenamic acid and acupuncture had the ability to reduce menstrual pain so that there were not significant differences.

**Conclusion:** there were differences in decreasing pre and post menstrual pain in the Acupuncture group Sp 6 and mefenamic acid. There was no difference in decreased dysmenorrhea pain between mefenamic acid and SP6 point acupuncture. So that SP6 acupuncture could be an alternative to non-drug therapy to reduce menstrual pain which did not cause side effects.

**Keywords:** mefenamic acid, SP6 point acupuncture, dysmenorrhea.

## 1.0 Introduction

Pain during menstruation was often complained of women as an uncomfortable sensation, even the onset of pain could interfere with activities and forced sufferers to rest and leave work or routine activities for several hours or several days. Dysmenorrhea was menstrual pain which was a symptom and not a disease. Considered most large women experienced some degree of pain pelvis during menstruation, hence the term of dysmenorrhea was only used for painful menstruation which quite heavy to cause sufferers were forced to seek the help of a doctor or self medication by analgesics<sup>1,2</sup>.

Dysmenorrhea was one of the most common gynecological complaints, especially in young women. This caused abdominal pain with back pain or other uncomfortable feelings before, after or during menstruation which greatly affected the quality of life<sup>3</sup>. Dysmenorrhea caused chronic pain that occur during menstruation and affected a large number of women's tools reproductive for many years. Pain during menstruation affected the daily activities, social activities, professional, personal also sexual activities.

Onset of dysmenorrhea often occurred in the past adolescence and in the second until the fifth year after menarche. The research was done in Jakarta showed that painful of menstruation most often appeared at the age of 12 years (46.7%). Most great sense of pain (89.7%) were located in the the bottom of abdominal part, while 5.3% on the side of the thigh and 4.4% on the buttocks. Other complaints accompanied menstruation painful was dizziness as much as 37.4%, sore head 16.6% and nausea 10.7%. The results of the research were as much as 76.6% of students did not get in school because of experienced of menstruation painful. A sense of discomfort that was not addressed would affect the function of the mental and physical of individuals required pharmacologically or non-pharmacologically action/ therapeutics<sup>1</sup>.

Treatment of pharmacology at the menstruation painful used the analgesic drug. Mefenamic Acid was one of the medicinal relief of pain and inflammation. These drugs included non-steroidal anti-inflammatory drugs (NSAIDs) worked to inhibit swelling, pain, stiffness, and fever. The medicine was indicated for patients with mild to moderate pain and diseases with inflammation, generally teeth pain, menstruation painful, muscles or joints painful, and pain of after childbirth.

Mefenamic acid was irritating to the stomach so it was better not to be used by people with stomach or intestinal injuries. This drug was also avoided in patients with liver or kidney disorders because these drugs were discharged through these organs so that it could aggravate abnormalities in liver and kidney function. The initial dose was given 500 mg, then followed by 4 x 250 mg. Mefenamic acid should not be taken more than 2500 mg per day. Giving acid Mefenamic advised not exceeding 7 days. The anti-pain effect occurred quickly a few hours after consumption, but the anti-inflammatory effect arised after several doses. Mefenamic acid was taken after meals because it could irritate the stomach.

An acupuncture had been used to treat dysmenorrhea and had been recommended as a nonpharmacological intervention. Acupuncture was a safe treatment which free from major side effects<sup>4</sup>. The acupuncture points that were always used in the treatment of dysmenorrhea were Quan Yen (LI 4) and San Yin Jiao (SP 6). Pricking acupuncture stimulated organ target through pathways reflex nerve humoral and autonomous, so that cyclic adenosine

monophosphate ( AMP ) increased, thus inhibited the release of mediators of mast cell (mastocyte)<sup>5</sup>.

Point of San Yin Jiao (SP6) was at the meridian spleen legs, namely poksimal prominens malleolus medial on the side edge of the posterior tibia. SP6 was a place of three Yin meeting namely the meridian of the spleen, liver and kidneys. Acupuncture believed that the SP6 affected the work way that was to strengthen the spleen and stomach associated with the production of energy (qi) and blood, removed the moisture, harmonized the liver working and strengthened the kidneys that impacted on the regulation of menstruation and induced the labor. The ability to harmonize bottom jiao impacted on urinary regulation and genitalia. In addition it also had an effect to soothe mental and facilitated the circulation of the blood that was on the three meridians Yin and reduced the senses<sup>6-8</sup>.

## 2.0 Materials and Methods

The target population in this study were students of the Poltekes of the Ministry of Health in Jambi who experienced dysmenorrhea. The sample in this study was the students of the Poltekes of the Ministry of Health in Jambi who experienced dysmenorrhea on the first day. There was also the size of the study sample determined by the difference formula of the average Two-way population obtained as many as 60 samples. The type of research was *quasi experiment*. The design used was nonrandomized pretest-posttest control group design. The dependent variable in this study was dysmenorrhea pain degree with measurement VAS (numeric rating scale). The independent variable was acupuncture therapy of San Yin Jiao (SP 6) on the right leg calf and use of mefenamic acid.

Instruments were used in research namely a form of questionnaire menstruation data and sheet of measurement scale VAS (numerical rating scale). Questioner obtained the data characteristics of the respondents in the form of data age , age of menarche, long dysmenorrhea, history of families experienced dysmenorrhea, long periods, distance menarche and onset of dysmenorrhea while experienced dysmenorrhea. The sheet measurement scale VAS (numerical rating scale) was a horizontal line in the form of numbers reflected a sense of pain that was experienced, categorized into no pain (score of 0) mild pain (score 1-3), moderate pain (score 4-6), severe pain (score 7-9), very severe pain (score 10).

## 3.0 Results

### 3.1 Characteristics of Research Subjects

Subjects in this study were students of the Poltekes Kemenkes of Jambi Department of Midwifery who met the inclusion criteria, characteristics of the subjects based on age, age at first menstruation, and duration of menstruation which shown in Table 1 below

**Table 1.** Characteristics of research subjects based on age, age at first menstruation and duration of menstruation

Variable	Group			
	Mefenamic acid (30)		Acupuncture (29)	
	mean ± Sd	Min - max	mean ± Sd	Min - max
age of respondent	17.8 ± 0.63	17-20	17.9 ± 0.70	16-20
age at first menstruation	12.7 ± 1.29	10-16	13.4 ± 1.18	12-16
number of menstrual days	6.4 ± 1.13	4-10	6.7 ± 1.0	4-10

In Table 1 above, could be seen that the age between the mefenamic acid group and the acupuncture group was the same, namely 17 years with a maximum age range of 20 years. The first age experienced menstruation for the younger mefenamic group compared to the acupuncture group. The menstrual period experienced by subjects both mefenamat and acupuncture groups was relatively the same, namely 6 days, with the longest time was 10 days.

The characteristics of the study subjects based on the duration of illness, pain time, and doctor's examination were presented in Table 2 below.

**Table 2.** Characteristics of research subjects based on duration of pain, time of pain, and see a doctor

Variable	Group			
	Mefenamic acid (30)		Acupuncture (29)	
	n	%	n	%
Duration of illness				
> 6 days	17	56.7	18	62.1
<6 days	13	43.3	11	37.9
Pain time				
Pre menstruation	6	20.0	7	24.1
During menstruation	23	76.7	22	75.9
After menstruation	1	3.3	0	0
See a doctor				
Yes	3	10.0	2	6.9
Not	27	90.0	27	93.1

Percentage of duration of illness > 6 days suffered in the acupuncture group more than mefenamic acid group. The percentage time of menstrual pain experienced by both the mefenamic acid group and acupuncture was almost the same, as well as the percentage of see the doctor was also almost the same.

### 3.2 Normality Test

**Table 3 .** Normality test for menstrual pain with the Kolmogorov Smirnov test

Variable	Mean $\pm$ SD	p	Information
Menstrual pain pre test	4.2 $\pm$ 1.1	0,0001	Data distribution was not normal
Menstrual pain Post test	2.8 $\pm$ 1.1	0,0001	Data distribution was not normal

Normality using the Kolmogorov-Smirnov test both in data menstrual pain pre-test and post test menstrual pain. The normality test results in Table 3 showed that menstrual pain data both pre-test and post-test were not normally distributed.

### 3.3 Wilcoxon Test

With the abnormal data distribution, the next test was the Wilcoxon test. Wilcoxon test was used to test the related data and the abnormal data distribution. The Wilcoxon test results presented in Table 4 showed that pain management with mefenamic acid and acupuncture all decreased significantly. The average decrease in the mefenamic acid group was 1.5 and in the acupuncture group was 1.4. These results indicated that pain management used mefenamic acid and acupuncture both reduce significant pain.

**Table 4 .** Wilcoxon test of menstrual pain in the mefenamic acid and acupuncture groups

Variable	Pre and post test of menstrual pain		P
	Negative	$\Delta$ Mean $\pm$ SD	
Mefenamic acid	30	-1.5 $\pm$ 0.6	0,0001
Acupuncture	29	-1.4 $\pm$ 0.5	0,0001

### 3.4 Man Whitney Test

The Wilcoxon test above was proceed with the Man Whitney test to find out that there was a difference in the decrease between menstrual pain treated with mefenamic acid and acupuncture. The results of the Man Whitney test for menstrual pain management between mefenamic acid and acupuncture showed that the difference between mefenamic acid and acupuncture was very small, only 0.1. These results indicated that the management of menstrual pain between mefenamic acid and acupuncture both had the ability reduced menstrual pain so that there was no significant difference between the two. The results of the Man Whitney test were shown in Table 5 below.

**Table 5 .** Man Whitney Test for changes in menstrual pain in the mefenamic acid and acupuncture groups

Variable	Mean $\pm$ SD	$\Delta$ Mean	z	P
Mefenamic acid	-1.5 $\pm$ 0.6	.10	-0,51	0.607
Acupuncture	-1.4 $\pm$ 0.5			

## 4.0 Discussion

The use of mefenamic acid at pharmacologically therapy which reduced the pain of menstruation was to inhibit cyclooxygenase, so it reduced the production of prostaglandins. Low levels of prostaglandins reduced uterine contractions, so that discomfort could be reduced. The results of this study indicated that mefenamic acid relieved menstrual pain significantly, but therapeutic pharmacological used mefenamic acid gave the side effect to the tract digestibility which often arise for example dyspepsia and symptoms of other irritation against the mucosa of the stomach .

The results of the Wilcoxon test analysis in this study were in line with the research of Ayu *et al* who showed a significant correlation between the level of pain intensity and the use of mefenamic acid in preclinical students of medical education of UNAND medical faculty 2010-2012<sup>9</sup>. Therapy used mefenamic acid was one of the most effective pharmacological therapies for treating primary dysmenorrhoea by inhibiting prostaglandin production that caused pain. The action mechanism of mefenamic drug was by inhibiting the enzyme cyclooxygenase so that the disruption of the conversion of arachidonic acid to Prostaglandin G<sub>2</sub>, Prostaglandin H<sub>2</sub> and Thromboxane A<sub>2</sub> which contributed to causing pain.

Similar results were also obtained from studies conducted by Manggalaputera whose results showed that mefenamic acid significantly decreased the level of menstrual pain and the average obtained was greater than Phaleria macrocarpa . The same thing also showed by Zhang and Li Wan said that acid Mefenamic including one of four types of NSAIDs (naproxen, ibuprofen, and aspirin) were effective to treat the primer dysmenorrhoea<sup>10</sup> .

In the research conducted by Risnomarta, it was found that mefenamic acid was the most NSAID which caused dyspepsia, which was 78.5%. Mefenamic acid was often used for short-term treatment such as dysmenorrhoea . Mefenamic acid dose was 2-3 times 250-500 mg a day. Side effects of the tract digestibility often arised for example dyspepsia , diarrhea to bloody and symptoms of other irritation against the mucosa of the stomach<sup>11</sup> .

In Wilcoxon analysis handling of menstrual pain with acupuncture massage at point 6 showed a significant reduction in menstrual pain levels. These results were supported by a study conducted by Sumanto<sup>6</sup> that acupuncture point sp 6 effectively reduced the level of menstrual pain on the students of Poltekkes of Surakarta with the understanding that the Sanyinjiao point (SP6) had the excitatory ability of central nervous system and peripheral in some aspects regulated the activities of neuroendocrine associated with expression of the hypothalamus pituitary ovary axis receptors<sup>12</sup>, increased levels of *Nitric oxide* (NO) so that it relaxed the uterine muscles and inhibited the contraction of uterus excess<sup>13</sup> , increased relaxation and reduced contraction of smooth muscle<sup>14</sup> , due to changes in mood of brain chemistry reduced serotonin level<sup>15</sup> and worked to increase the secretion of the body's endomorphins<sup>16</sup> , and increased the level of neuropeptide Y<sup>17</sup>. This condition could eventually overcome the menstrual pain of women with dysmenorrhea, stimulated the nerve location in both muscles and other tissues, thereby encouraged the release of endorphins and other neuro hormonal factors resulting in changes in pain processes in the brain and spinal cord<sup>18</sup> , reduced the level of inflammation by increasing the smoothness of blood vessels and released imunomodulari factor<sup>19</sup> .

This result was also supported by research conducted by Mukhoirutin on acupressure at the SP 6 point for the reduction in menstrual pain also showed significant results. Acupuncture on sanyinjiao point (SP 6) served to strengthen the spleen and restored the balance of Yin and

blood, liver, and kidneys, so that it strengthened blood circulation, thus acupuncture at point sanyinjiao reduced the pain of dysmenorrhea<sup>20</sup>.

The research result was reinforced by Gharloghi, that the intensity of menstrual pain of the woman dysmenorrhea could be reduced by akupresure Sanyinjiao point empirically to reduce the intensity of woman menstrual pain with primary dysmenorrhea ( $p < 0.001$ )<sup>7</sup>. Also supported by the discovery of Chen who explained that dysmenorrhea could be reduced with acupresure Sanyinjiao point (SP6) of 94%<sup>21</sup>.

Furthermore, in the analysis of the Man Whitney Test found that between handling menstrual pain using mefenamic acid and acupuncture was not significant. This indicated that mefenamic acid and acupuncture both were equally effective for lowering level of menstrual pain. Different results shown by research conducted by Sari who examined the effectiveness of Pharmacological and Non- Pharmacological Therapy Against Menstrual Painful (dysmenorrhea) at Students of Class XI in SMA Negeri 1 of Pemangkat which obtained the results of independent t-tests. There were differences in the average decrease in dysmenorrhea between pharmacological and non pharmacological therapy with p value 0, 01<sup>22</sup>.

By getting these results it was better to manage menstrual pain (dysmenorrhea) using acupuncture therapy. The choice of acupuncture therapy at the SP6 point significantly reduced the level of dysmenorrhea pain and did not cause side effects, on the contrary the management of menstrual pain by using mefenamic acid will cause dyspepsia if it was not right. Dyspepsia was a syndrome or the symptoms in the form of pain or discomfort in the epigastrium, bloating, nausea, vomiting, feeling full quickly or feeling full stomach, and feeling like a suffocation from the epigastrium upwards.

## 5.0 Conclusion and recommendation

There were difference in reduction of pain of pre and post menstrual in the group of acupuncture Sp 6 and mefenamic acid on Wilcoxon analysis. There was no difference between acupuncture therapy and mefenamic acid in decreasing menstrual pain in the analysis of the Man Whitney test . Acupuncture therapy and mefenamic acid were effective in decreasing menstrual pain.

Management of menstrual pain (dysmenorrhea) should use acupuncture therapy at the SP 6 point because it did not cause side effects. The use of mefenamic acid should use the right dose so that it did not cause side effects.

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## References

1. Ernawati, Hartiti T, Hadi I. Terapi Relaksasi Terhadap Nyeri Dismenore Pada Mahasiswa Universitas Muhammadiyah Semarang. Prosiding Seminar Nasional Unimus. 2010; 1(1):106-113
2. Osayande AS, Mehulic S. Diagnosis and initial management of dysmenorrhea. American family physician. 2014;89(5):341-6.
3. Kiran G, Gumusalan Y, Ekerbicer HC, Kiran H, Coskun A, Arikan DC. A randomized pilot study of acupuncture treatment for primary dysmenorrhea. European Journal of Obstetrics & Gynecology and Reproductive Biology. 2013;169(2):292-5.
4. Reyes-Campos MdJ, Díaz-Toral LG, Verdín-Terán SL, Orozco-Suárez ES, López-Ramírez P, Pineda-Carranza A, et al. Acupuncture as an Adjunct Treatment for Primary Dysmenorrhea: A Comparative Study. Medical Acupuncture. 2013;25(4):291-4.
5. Junizar G, Sulianingsih WK. Pengobatan dismenore secara Akupunktur. Cermin Dunia Kedokteran. 2004;133:50-3.
6. Sumanto S. Penurunan Nyeri Dismenorhoea Menggunakan Titik Akupuntur Guanyuan (Ren 4), Guilai (St 29) Dan Sanyinjiao (Sp 6) Pada Mahasiswi Poltekkes Surakarta. Interest: Jurnal Ilmu Kesehatan. 2015; 4(1).
7. Gharloghi S, Torkzahrani S, Akbarzadeh AR, Heshmat R. The effects of acupressure on severity of primary dysmenorrhea. Patient Prefer Adherence. 2012;6:137-42
8. Chen H-M, Chen C-H. Effects of acupressure at the San Yin Jiao point on primary dysmenorrhoea. Journal of Advanced Nursing. 2004;48(4):380-7.
9. Ayu MR, Alioes Y, Rahmatini, Hubungan Derajat Nyeri Dismenorea terhadap Penggunaan Obat Anti Inflamasi Non Steroid. Jurnal Kesehatan Andalas. 2015; 4(2): 551-555.
10. Manggalaputra AA. Perbandingan Efektivitas Analgetik Phaleria macrocarpa dan Asam Mefenammat pada Penderita Dismenore. Undergraduate thesis, Universitas Kristen Maranatha; 2016.
11. Risnomarta SD, Arnelis, Ermawati. Hubungan OAINS pada Pengobatan Dismenorea dengan Kejadian Dispepsia pada Mahasiswi Fakultas Kedokteran Universitas Andalas. Jurnal Kesehatan Andalas. 2015; 4(2): 415-420.
12. Liu J et al. The Safety of Electroacupuncture at Hegu (LI 4) Plus Oxytocin for Hastening Uterine Contraction of Puerperants--Arandomized Controlled Clinicalobservation. J Tradit Chin Med. 2008;28:163-7.
13. Wang SM et al. Auricular Acupuncture as a Treatment for Pregnant Women Who Have Low Back and Posterior Pelvic Pain: a Pilot Study. Am J Obstet Gynecol 2009;201:271.e1-9
14. Samuels N et al. Acupuncture for psychiatric illness: a literature review. Behav Med 2008; 34: 55-64

15. Zhou Q et al. The Effect Of Electroacupuncture on The Imbalance between Monoamine Neurotransmitters and GABA in the CNS of Rats With Chronic Emotional Stress-Induced Anxiety. *Int J Clin Acupunct* 2008 ;17: 79-84.
16. Han JS. Acupuncture andendorphins. *Neurosci Lett* 2004; 361:258-61.
17. Lee B et al. Effects of Acupuncture on Chronic Corticosterone-Induced Depression-Like Behavior And Expression of Neuropeptide Y in the Rats. *Neuroscience Letters* 2009; 453:151-6.
18. Cheng KJ. Neuroanatomical Basis of Acupuncture Treatment For Some Common Illnesses. *Acupunct Med* 2009;27: 61-4.
19. Kavoussi B, Ross BE. The Neuroimmune Basis of Antiinflammatory Acupuncture. *Integr Cancer Ther* 2007; 6: 251-7.
20. Mukhoirotin, Fatmawati DA. Pengaruh Akupresur pada Titik Sanyinjiao dan Slow Stroke Back Massage terhadap Penurunan Intensitas Nyeri Haid (dismenorea). *Prociding, Muswil Ipemi Jateng*, 17 september 2016
21. Chen ML, Lin LC, Wu SC & Lin JG. (1999). The Effectiveness of Acupressure In Improving The Quality Of Sleep Of Institutionalized Residents. *Journal of Gerontology*54A: 389-394.
22. Sari WP, Ligita T, Nurfianti A. Efektivitas Terapi Farmakologis dan non-Farmakologis terhadap Nyeri Haid pada Siswi SMA Negeri 1 Pemangkat. *Jurnal Proner*, 2014; 1(1):1-5.