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## Efek Electro Therapy Trabert current and Pulse burst Knee Osteoarthritis pain grade II

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### ABSTRACT

**Background:** osteoarthritis has fairly high prevalence of around 2.3% to 11.3%. Osteoarthritis is a degenerative disease which attacks the cartilage to the synovial joint. The problems that rise frequently are pain and discomfort. One of the physiotherapy actions that can be done in cases of osteoarthritis in reducing pain is using Transutaneus Electrical Nerve Stimulation (TENS) flow trabert. To find out the results of reducing pain and activity ability after being given therapy using the WOMAC measuring instrument.

**Objectives :** (1) determine the effect of TENS trabert current in cases of knee osteoarthritis, (2) find out the results of the effect of reducing pain with the WOMAC measuring instrument for a month.

**Method :** The research type is using quasi-experimental with pre-post with control group. samples taken by consecutive sampling technique

**Research Results:** there is an effect between both trabert current and pulse burst on the reduction of knee osteoarthritis pain. However, pulse burst is more effective than trabert current in reducing pain. The sensation feeling in the pulse burst is also more comfortable than the Trabert current.

**Conclusion :** there is an effect of reducing pain after being given physiotherapy measures in the form of TENS trabert current

**Keywords :** knee osteoarthritis, pain, TENS, TRABERT CURRENT, WOMAC



## PRELIMINARY

According to Abdurrachman et al (2019) The prevalence of knee osteoarthritis cases in the world belong to high category, which is 2.3% to 11.3% and this prevalence will increase in 2020 along with the increasing elderly population in the world. Osteoarthritis of the knee is a degenerative joint disease that attacks the synovial joints up to the cartilage of the knee. (Abramoff et al., 2020).

according to Wijaya (2018) The case of knee osteoarthritis, there is severity degree of severity that can be seen from the classification of the following five grades of osteoarthritis: (0) – normal, no visible signs of radiological disturbance of the knee, grade (1) – doubtful, without osteophyte grade (2) - level mild, there are few osteophytes and no inter-joint space at the knee and grade (3) – moderate osteophytes, marked joint space narrowing, sclerosis seen, possible deformity of bone ends, grade (4) - large osteophytes, marked joint space narrowing, severe sclerosis, the presence of deformity of the ends of the bones.

Many people with osteoarthritis ranging from grades 2 to 4 complain of discomfort such as pain. Pain arises due to inflammation in the joints so people with osteoarthritis experience a decrease in physical function. This will affect limitation of movement, decreased strength and muscle balance (Nurhalimah, 2020).

According to (Surakarta, nd) In terms of decreasing the pain in people with osteoarthritis, there is an electric current method that stimulates the nerves through the skin surface with a tool TENSTrabert current and pulse burst. Trabert current is modification of IDC dan rectangular pulse, current duration 2 mS, 5 mS intervals. Then pulse burst has basic physics frequency 1 – 10 Hz, time duration 200 S.

according to Kim et al (2020) To find out if there is a change after being given therapy, it can be measured with the Western Ontario and McMaster Universities Osteoarthritis Index (WOMAC) measuring instrument. The WOMAC measurement tool is an assessment in the form of a questionnaire is used to evaluate knee condition and hip OA patients that focuses on assessing pain, stiffness, activity limitations of knee and hip OA patients. (Knee & Indonesia, 2020).

## RESEARCH METHODS

### *Ethical Clearance*

This research was obtained approval from the Health Research Ethics Commission, Faculty of Medical Sciences, University of Muhammadiyah Surakarta.

### *Research methodology*



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The research type is a quasi-experimental research which aims to demonstrate the relationship between electric current and pain stimuli involving the Trabert Current group and the Pulse Burst group, the two groups were not selected randomly. The number of respondents who entered was six respondents, of the six respondents there were two respondents who were excluded because they were taking pain medication. while the other 4 respondents who were included in the inclusion criteria were randomly distributed envelopes containing each group. from the randomization, the results were 2 respondents in the pulse burst group and 2 respondents in the trabert current group.

Which include Inclusion criteria in sampling included: (1) patients aged 60-65 years (2) osteoarthritis grade two - three according to the results of clinical records (3) not currently doing strenuous activities (4) not currently taking pain medication (5) never got Hyaluronic acid injection (6) communicates well. While the exclusion criteria included: (1) osteoarthritis grades one and two (2) currently undergoing other treatment (3) having had knee surgery (4) unable to follow a predetermined schedule (5) unable to read and write. The normality test of data is using Shapiro Wilk's test, then to research the difference in the effect of TENS pulse burst and trabert current using the Wilcoxon non-parametric test method. Then to find out the difference in the effect, the Wilcoxon Non-parametric test was used to determine the statistical test.

### *Measurement of pain and functional activity*

Examination of pain and functional activity with (WOMAC) (Figure 1). Respondents were asked to fill out a questionnaire every week before doing therapy and how they felt about the respondent during the last 48 hours. Respondents should answer the pain by a scale started value 0 does not exist flavor pain, 1 mild, 2 moderate, 3 severe, 4 very severe. Then the total value of the question describes the interpretation of WOMAC. Within 0-20 total value, 24-48 moderate, 48-72 severe/severe and 72-96 very heavy.

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Nama Lengkap Anda: [REDACTED] tanggal hari ini: 3 / 7 / 2020  
Bulan / Hari / Tahun

Nomor RM: [REDACTED]

Alamat: Lot 001/011, Mprundul, Kebonaran, Niten ARUJ TRABERT

**INDEKS OSTEOARTRITIS WOMAC**

1. Pertanyaan-pertanyaan berikut menyangkut jumlah rasa sakit yang anda alami saat ini di lutut setiap situasi. Silahkan masukkan jumlah rasa sakit yang anda alami dalam waktu 48 jam terakhir.

	Tidak ada	ringan	sedang	parah	ekstrem
a. Berjalan dipermukaan yang rata	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
b. Naik atau turun tangga	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
c. Pada malam hari di tempat tidur	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
d. Duduk atau berbaring	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
e. Berdiri tegak	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>

2. Jelaskan tingkat rasa sakit yang anda alami dalam waktu 48 jam terakhir untuk masing-masing lutut anda

a. Lutut kanan	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
b. Lutut kiri	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

3. Seberapa parah kekakuan pada lutut anda setelah bangun pertama pada pagi hari?

<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
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4. Seberapa parah kekakuan Anda setelah duduk, berbaring, atau beristirahat di kemudian hari?

<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
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5. Pertanyaan-pertanyaan berikut menyangkut fungsi fisik Anda. Kemampuan Anda untuk bergerak dan menajagi diri sendiri. Untuk masing-masing kegiatan berikut, harap tunjukkan tingkat kesulitan yang Anda alami dalam 48 jam terakhir, di lutut Anda.

Apa tingkat kesulitan yang Anda miliki dengan :

a. Turun tangga	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
b. Naik tangga	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
c. Bangkit dari duduk	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
d. Berdiri	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
e. Membungkuk ke lantai	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
f. Berjalan dipermukaan rata	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
g. Masuk/keluar mobil	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
h. Pergi berbelanja	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
i. Mengenakan kaos kaki	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
j. Bangkit dari tempat tidur	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
k. Meripati kaos kaki	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>

Figure 1. WOMAC

## RESULTS AND DISCUSSION

The distribution of respondents based on the duration of suffering from knee osteoarthritis was found to have suffered 3 months before therapy (25%), 3.5 months before therapy (25%) and 4 months (50%).

In each meeting the respondent should fill out a questionnaire from the WOMAC measuring instrument. In the first treatment group (Trabert Current) the results were obtained after five meetings that is the average level of pain felt 61.00 with a standard deviation of 20.00. While in the second treatment group (pulse burst) the average level of pain felt is 60.90 with deviation standard of 17.08.

The WOMAC measurement data for five meetings was used to determine the effects on the two treatment groups. Obtained normality test results:



Table 1. Shapiro Wilk normality test

Treatment	Statistics	N	P-value	criteria
pulse burst	0.942	10	0.571	>0.05
Trabert current	0.939	9	0.575	>0.05

Obtained existence effect of the effectiveness of TENS pulse burst in reducing pain of patients with knee osteoarthritis. there is a probability value (P-value) for pain measurement of 0.571 more than 0.05 compared to TRAbert current TENS with a probability value (P-value) of 0.575. The data is included in distributed data.

Then to test the difference in the effect between Trabert current with pulse burst in drop nyeri osteoarthritis used test :

Table 2. Mann Whitney test

Treatment	Rank		
	N	Mean Rank	Sum of Rank
Pulse Burst	10	10.70	107.00
Trabert current	10	10.30	103.00

From the data above, there is no significant difference between pulse burst and trabert current to reduce osteoarthritis pain knee.

## DISCUSSION

According to Ismaningsih et al .,(2018) conducted states that musculoskeletal disorders often occur in the elderly osteoarthritis. Indonesia prevalence of knee osteoarthritis based on age 5% at age <40 years, 30% age 40 until 60 years and 65% age of >61 years. Osteoarthritis knee cause structural abnormalities such as joints, cartilage, subchondral, synovial fluid, and ligaments in the knee joint area.

according to Jamaludin et al .,(2021) complaint that often arise from this is painful. Taste disappears and appears in the acute phase. One of the treatments to reduce pain is TENS pulse burst or Trabert current.



According to Mi et al .,(2019)Pulse burst has the effect of reducing pain when applied to pain points in osteoarthritis of the knee. Meanwhile, Trabert current also has a good effect on reducing pain in osteoarthritis of the knee when applied properly to the source of pain(Surakarta, nd).

However, from the results of reducing pain and increasing functional activity in WOMAC, there is a comparison between the effectiveness of pulse burst and trabert current. Pulse burts are more effective in reducing knee osteoarthritis pain with P-v of 0.571 which is more than 0.05 while the Trabert Current has a P-v of 0.575 more than 0.05 (Kim et al., 2020).

At the third meeting of the pulse burst procedure, there was a significant reduction in pain when the electrode placement was moved to the lateral and medial sides of the knee, but the same method when applied to the Trabert current had no significant effect on the results of pain reduction. The pulse burst also more comfortable sensation than the trabert current when the current wave started activated in respondents with grade III osteoarthritis.

## CONCLUSION

Based on the results of this research concluded There was pain reduction for 5 treatments with the same electrode placement using TENS pulse burst and trabert current when measured using the WOMAC index in grade 3 OA patients. However, pulse burst was more effective in reducing pain measured from the total WOMAC index value at the third meeting when The electrodes are positioned on the lateral and medial sides of the knee and this current also has more comfortable sensation than the Trabert current.

## SUGGESTION

Subsequent research can conduct research that can minimize existing deficiencies related to the comparison of Pulse Burst and Trabert Arus Current on Transcutaneous Electrical Nerve Stimulation (TENS) in reducing knee osteoarthritis pain both bilateral and unilateral grade 3.

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