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The Utilization of Castor Leaf Extract (Jatropha Curcas L.) as a Gel Compress to Improve Temperature in Stroke Patients: A Clinical Study

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ABSTRACT

Background: Stroke is a significant health issue in modern life, as it is a leading cause of death and disability due to inflammation that can lead to infarction. The application of castor leaf extract gel compress is anticipated to prevent inflammation in stroke patients due to its anti-inflammatory phytochemical content. **Methods:** This quasi-experimental study employed a non-randomized pre-test-post-test design. It was conducted in the Sidoarjo district with stroke patients receiving outpatient care at the Neurology Department of RSU Al-Islam H.M. Mawardi. A sample of 28 patients received the castor leaf extract gel compress before, during, and after the intervention, with temperature measurements taken. The compress was applied twice daily at 08:00 AM and 12:00 PM for two months. Data were analyzed using the T-test. **Results and Novelty:** Results showed a decrease in temperature from an average of 37.8°C in the first week to 36.5°C in the third week. The T-test analysis yielded a significance value of 0.000, indicating a significant difference between the first and third weeks. **Conclusion:** It is concluded that castor leaf extract gel compress can improve temperature in stroke patients. Therefore, stroke patients should receive castor leaf extract gel compresses to prevent inflammation and avoid the expansion of infarction.

Keywords: Gel compress, Castor plant leaves, Stroke, Inflammation

INTRODUCTION

Stroke is a very big health problem in modern life today because it is the third leading cause of death and the number one cause of disability in the world, due to... inflammation Which at risk become infarction [1]. Effort For reduce expansion infarction so that there is no recurrence of stroke attacks in patients which results in their condition getting worse and ultimately the stroke patient is not productive and becomes a burden on the family and the government regarding the costs borne by BPJS for the large costs of care and treatment [2].

For this reason, researchers are offering something new by providing a gel compress with castor oil leaf extract, which is expected to prevent inflammation in stroke patients because it contains... phytochemicals Which Wrong One its function as anti-inflammatory [3]. On test physical and physical stability Which has done on formulation extract leaf distance fence proven has fulfil The criteria for a gel compress preparation are organoleptic stability, stable pH according to skin pH, homogeneity, normality, spreadability on the skin within normal limits, and viscosity according to standards [4].

Study This is continuation from study Which Already done with objective end a topical herbal medicine product design in the form of gel compresses from jarak pagar leaves as an alternative therapy for stroke patients. The urgency of the

research was conducted to reduce the cost burden, to improve patient health so that they can be independent as well as productive and this discovery can be used by the community as appropriate technology in the health sector to provide health services to accelerate healing, prevent

and control disability and recurrent attacks caused by the expansion of infarction [5].

RESEARCH METHOD

This study aims to prove the use of castor oil leaf extract as a gel compress to improve temperature in stroke patients through clinical studies. which is a test of gel compresses of castor oil plant leaf extract (Jatropha Curcas L) for the first time in post-stroke patients. The clinical trial was conducted without a comparison compress and no control group. control. On a number of small subject with observation intensive by neurologist with 28 post-stroke patients as respondents

This research method uses an experimental design with pre-test and post-test in one group. A total of 28 stroke patients who met the inclusion criteria were taken as research subjects. Before selecting respondents were given informed consent And explained intervention Which will given as well as effect In addition, the next step is to perform a single concentration of 1.5% gel extract compress of jarak pagar leaves because it has proven to be the most effective in preclinical trials. Compress gel extract leaf distance fence applied as compress on part forehead twice a day at 08.00 and 12.00 WIB for 8 weeks which is currently in the fourth week. Body temperature measurements were carried out pre-intervention, every week and post-intervention. In this study, the statistical method used was the t-test to test whether there was a difference in temperature in stroke patients before and after being given a gel compress of jarak pagar leaves (Jatropha Curcas L).

RESULT AND DISCUSSION

Table 1. Results of measurements of average body temperature of stroke patients during the observation period. before intervention, during intervention And post intervention 8 weeks.

Respondents	Average Temperature (^{0}C)								
		Week 2-							
	Pre	I	II	III	IV	V	VI	VII	VIII (Post)
1	37.6	37.4	37.1	37	37	36.9	36.7	36.7	36.7
2	37.8	37.1	36.9	36.9	36.8	36.8	36.8	36.8	36.7
3	38.1	37.7	37.5	37.2	37.2	37.2	37.1	36.9	36.9
4	37.8	37.5	37.6	37.5	37.4	37.4	37.2	37	36.8
5	37.9	37.3	37.4	37.2	37	37	37	36.9	36.9
6	38.2	37.9	37.7	37.6	37.4	37.3	37	36.8	36.5
7	37.7	37.4	37.9	37.8	37.6	37.4	37.2	37	36.8
8	37.9	37.6	37.5	37.4	37.3	37.1	37	37	36.8
9	37.8	37.5	37.6	37	37.4	37.1	37	36.9	36.8
10	37.9	37.4	37.1	36.7	36.5	36.5	36.4	36.4	36.3
11	38.4	38	37.8	36.9	37	36.8	36.8	36.7	36.5
12	38.1	37.9	37.5	36.6	36.5	36.5	36.4	36.3	36.3
13	37.8	37.5	37.6	36.9	36.7	36.6	36.6	36.6	36.5
14	37.9	37.6	37.4	37	37.2	37.2	37	36.8	36.7
15	37.7	37.4	37.8	37.2	37	36.8	36.6	36.6	36.5
16	37.6	37.3	37.3	37.1	37.3	37.2	37.1	36.8	36.5
17	37.6	37.4	36.8	36.7	36.9	36.9	36.7	36.5	36.5
18	37.9	37.5	37.6	37	37.1	36.9	36.8	36.6	36.6

19	37.6	37.8	37.1	36.8	36.7	36.5	36.5	36.4	36.3
20	37.8	37.7	37.6	37.3	37.2	37	37	36.8	36.7

From the table above, it can be seen that the trend in observations of the average body temperature of each respondent during 8 Sunday. Experience change from Sunday to 1 until Sunday to 8. On Sunday Pre intervention (Sunday 0th) Part big Respondent own temperature average body around 37.5°C until 38.4°C, with part small Which is at A little in below or above the range. While post intervention (Week VIII) body temperature tends to decrease in a way consistent from Sunday 1st until Sunday 8th. Temperature average part big Respondent decrease around 0.6°C until 1.0°C during period the. This can be seen from Respondent 1 Pre-intervention temperature of 37.6°C in the first week and post-intervention decreased to 36.7°C in the eighth week, indicating a decrease of about 0.9°C. Respondent 2 showed a decrease from 37.8°C to 36.7°C, a decrease of about 1.1°C. In general, body temperature in the first week (Week I) was slightly higher on average compared to the following weeks. Week VIII showed a lower body temperature at the end of the period, with most respondents' body temperatures ranging from 36.1°C to 36.9°C.

Table 2. Statistical description

	N	Minimum	Maximum	Mean	Std. Deviation
pre temperature	28	36.80	38.40	37.7714	.28913
post temperature	28	36.10	36.90	36.5679	.21091

Based on the descriptive statistical test table data for pre and post temperatures, it shows a significant decrease from 37.77°C (pre) to 36.57°C (post), Parameter (temperature shows a consistent decrease after the intervention. This decrease can indicate a positive effect of the intervention carried out, to prove that the gel compress intervention is significant, a t-test is carried out.

Table 3. Paired Sample Statistics Table

	Mean	N	Std. Deviation	Std. Error Mean
Pre temperature	37.7714	28	.28913	.05464
Post temperature	36.5679	28	.21091	.03986

Based on statistical test table data descriptive for pre temperature and post, temperature decreased from 37.77°C (pre) to 36.57°C (post), with slightly lower variation in post. The smaller standard error of the mean in post indicates better stability after the intervention.

Table 4. Table Paired Samples Test

Paired Differences								
				95% Confidence Interval of the Difference				
	Mean	Std. Deviation	Std. Error Mean	Lower	Upper	t	df	Sig. (2-tailed)
Pair 1 temperature before - post temperature	1.20357	.31089	.05875	1.08302	1.32412	20.485	27	.000

Based on data table test t For temperature before And post, showed a

significant difference of 0.00 where the value is less than the p-value <0.05, which indicates that the difference is significant. The average body temperature decreased after the intervention, with a decrease the biggest happen on temperature body (1.20°C) This change shows that the intervention carried out can have a significant effect on body temperature in post-stroke patients.

Stroke is a medical condition that requires immediate attention because it can cause long-term disability or death. This condition occurs due to impaired blood flow to the brain, either due to a blockage (ischemic stroke) or bleeding (stroke hemorrhagic). Wrong One problem clinical on patient stroke is imbalance temperature body, Which can influence prognosis patients. (6) . This condition also involves a complex inflammatory response, which can worsen brain tissue injury. One of the main components of this inflammatory response is increased levels of Interleukin-1 beta (IL-1β), a proinflammatory cytokine that plays an important role in the pathological mechanisms of stroke. IL-1β stimulates release enzyme Which damage, mediate apoptosis, And aggravate blood-brain barrier dysfunction.(7). Wrong One component main from response inflammation This is increased levels of Interleukin-1 beta (IL-1β), a proinflammatory cytokine that plays an important role in mechanism pathology stroke. IL-1β stimulate release enzyme Which to damage, to mediate apoptosis, And to aggravate dysfunction barrier blood-brain. Hypothermia or hyperthermia can also worsen neurological damage by increasing the metabolic needs of brain tissue, enlarging the ischemic area, and inducing the inflammatory process. (8). Based on the results of the study and statistical tests carried out, it was proven that significant results were obtained. that compress gel extract leaf distance fence can repair temperature patient's body post stroke. Matter This because of that Leaf distance fence has long used in traditional medicine because it contains various beneficial bioactive compounds, such as flavonoids, tannins, and saponins, which are known to have anti-inflammatory and antipyretic effects(9).

This research is in line with the research results which states that the flavonoid content in castor oil plant leaves has significant antipyretic and antioxidant activity, which can be used to help regulate body temperature (10). study other, gel extract leaf distance fence proven stable And has potential as a topical agent in reducing inflammation (11). The cytotoxic effects of bioactive compounds such as flavonoids and tannins also provide additional benefits in managing inflammatory responses in post-stroke patients (12).

According to Sari And Pramudya (2019)(13) find that extract leaf Jatropha curcas has significant wound healing activity in Wistar rats. Their research shows that bioactive compounds in Jatropha curcas leaf extract such as flavonoids and saponins can stimulate cell regeneration and accelerate the wound healing process through anti-inflammatory and antioxidant mechanisms.

Providing non-pharmacological therapy such as gel compresses of castor oil plant leaves (Jatropha curcas) began to be studied as an alternative to help normalize the body temperature of stroke patients. Jatropha leaves have long been used in traditional medicine because they contain various beneficial bioactive compounds, such as flavonoids, tannins, and saponins, which are known to have anti-inflammatory and antipyretic effects.(14)

Abnormal body temperature can accelerate neuron damage and enlarge the area of brain infarction. Therefore, maintaining body temperature within the normal range (36.5–37.5°C) is one of the main goals in stroke management. Hyperthermia can increase the risk of cerebral edema, while hypothermia carries the risk of causing coagulation disorders and cardiac arrhythmia. (15) Stable body

temperature helps the healing process of damaged brain tissue and increases the effectiveness of rehabilitation therapy. Mechanism of ActionJatropha leaf gel compress works by lowering body temperature through several mechanisms. Applying cold gel to the skin can help absorb heat from the body, thereby lowering local and systemic temperatures. (16).

Flavonoids have an antipyretic effect by inhibiting the synthesis of prostaglandins which play a role in increasing body temperature. Saponins have an anti-inflammatory effect which helps reduce the inflammatory response which triggers an increase in body temperature. Tannins play a role in accelerating the tissue repair process and stabilizing body temperature. (17)

Research shows that castor oil plant leaves (Jatropha curcas) contain active compounds such as flavonoids, tannins, and saponins, which are known to have anti-inflammatory and antioxidant effects. The formulation of castor oil plant leaf extract in topical gel form offers a practical and effective application to treat inflammation in stroke patients.(18)

According to the researcher's opinion, the temperature an abnormal body can accelerate damage neuron And enlarge area infarction brain. By Because Therefore, maintaining body temperature within the normal range (36.5–37.5°C) is one of the main goals in stroke management, namely minimizing the risk of complications of hyperthermia. can increase risk edema cerebral, whereas Hypothermia carries the risk of causing coagulation disorders and cardiac arrhythmias.

CONCLUSION

The gel compress of castor oil leaf extract has been proven to be significantly effective can improve body temperature in post-stroke patients. With a working mechanism involving the physical effects of cooling and bioactive activity of the content of castor oil leaves, this therapy not only lowers body temperature but also provides anti-inflammatory effects that can improve the microenvironment around network brain Which injury, support process neuroplasticity And regeneration. Giving compress gel extract leaf distance fence give hope as complementary therapy in stroke patients. The main implications include, the results of this study support the use of natural ingredients in the management of inflammation in post-stroke patients. stroke, application topical gel allow use Which comfortable And can be integrated with conventional therapy.

Overall, the gel compress of castor oil plant leaves extract offers an innovative approach as an alternative therapy based on safe and effective natural ingredients, especially for patients who cannot receive conventional pharmacological therapy. The gel compress of castor oil plant leaves extract can be used as a supportive therapy together with anti-inflammatory and neuroprotective drugs for better clinical outcomes.

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