Frontiers in Health Informatics
ISSN-Online: 2676-7104
www.healthinformaticsjournal.com
2024; Vol 13: Issue 8
Open Access

Evaluation Of Analgesic Activity Of Siddha Formulation Karunkurinji Kudineer In Wistar Albino Rats

Kavitha Subramanian*[1], Suguna Mani[2], Saravanasingh Karan Chand Mohan Singh[3], A. Jayakalaiarasi[4], R.Aravinda Senbagaraman[5], Subaraj.S[6], Priyadharshini.S[7], S.Tamilselvi[8], D.A. Kumarakurubaran[9], S.Magudapathi[10]

[1]Resident Medical Officer, National Institute of Siddha, Ministry of AYUSH, Govt of India, Chennai-47

[2]Assistant Professor, Department of Siddha Maruthuva Moola Thathuvam, National Institute of Siddha, Ministry of AYUSH, Govt of India, Chennai-47

[3]Assistant Professor, Department of Maruthuvam, National Institute of Siddha, Ministry of AYUSH, Govt of India, Chennai-47

[4] Associate professor, Department of forensic medicine and toxicology, Santhigiri siddha medical college and research organization, Trivandrum, kerala -695589

[5]Medical officer, National Institute of Siddha, Ministry of AYUSH, Govt of India, Chennai-47

[6]Emergency Medical officer, National Institute of Siddha, Ministry of AYUSH, Govt of India, Chennai-47

[7]Ph.D Scholar, Department of Kuzanthai maruthuvam, National Institute of Siddha, Ministry of AYUSH, Govt of India, Chennai-47

[8]Professor, Department of Gunapadam Marunthakaviyal, Sri Sairam Siddha Medical College and Research Center, West Tambaram, Chennai- 44.

[9]Associate Professor, Department of Udal Koorugal, National Institute of Siddha, Ministry of AYUSH, Govt of India, Chennai-47

[10]Assistant Medical Officer, Government District Headquarters Hospital, Mettur, Salem District

Cite this paper as: Kavitha Subramanian, Suguna Mani, Saravanasingh Karan Chand Mohan Singh, A. Jayakalaiarasi, R.Aravinda Senbagaraman, Subaraj.S, Priyadharshini.S, S.Tamilselvi, D.A. Kumarakurubaran, S.Magudapathi (2024). Evaluation Of Analgesic Activity Of Siddha Formulation Karunkurinji Kudineer In Wistar Albino Rats. *Frontiers in Health Informatics*, *13 (8) 3870-3875*

Abstract:

This study aimed to evaluate the analgesic efficacy of Karunkurinji Kudineer. A total of four groups of six albino rats each were established: Group I received distilled water, Group II received 10 mg/kg of aceclofenac sodium, Group III received 10 mg/kg of Karunkurinji Kudineer, and Group IV received 20 mg/kg of Karunkurinji Kudineer. The acetic acid-induced writhing method was employed to assess the analgesic effect. The group I exhibited the highest number of writhes (37.2±2.3), while the aceclofenac sodium group had the lowest (7.9±0.6). Group IV demonstrated a significant reduction in writhes (11.6 ±0.8) compared to Group III (12.0±1.2). Statistical analysis yielded significant results ($P<0.05$). These findings suggest that the Siddha formulation Karunkurinji Kudineer possesses analgesic efficacy and may serve as an alternative treatment for painful conditions.

Keywords: Siddha, Analgesic, Albino rats, Writhing method, Acetic Acid.

Introduction:

Pain is defined by the International Association for the Study of Pain (IASP) as "an unpleasant sensory and emotional experience associated with actual or potential tissue damage" (1,2). It is triggered by various biochemical mediators, including prostaglandins, bradykinins, and substance P, which interact with nociceptors (3,4). These mediators can lead to both chronic and acute pain. Chronic pain is characterized by persistent discomfort over an extended period, while acute pain has a rapid onset and short duration, typically lasting only a few hours (5,6). Consequently, effective pain management is one of the primary concerns in medical treatment.Research into diverse methods for pain relief is essential due to the widespread prevalence of pain. Medicinal herbs have been utilized for therapeutic purposes for centuries and are often associated with fewer side effects compared to conventional medications.

Pain and inflammation are common symptoms of various conditions. Although non-steroidal anti-inflammatory drugs (NSAIDs) and opioids are frequently prescribed to manage these symptoms, they can cause adverse effects such as gastrointestinal issues, kidney damage, respiratory depression, and dependence (7,8). As a result, there has been increasing interest in exploring alternative analgesic treatments derived from natural sources, such as Siddha formulations.Karunkurinji Kudineer (KK) is a polyherbal formulation traditionally used to treat lumbar spondylosis (Korai Vatham) (9). This study aims to assess the analgesic effects of Karunkurinji Kudineer using an acetic acid-induced writhing test in rats (10-16).

2. Materials and Methods:

2.1 Drug selection:

KARUNKURINJI KUDINEER was taken as a trial drug from the Siddha literature (9).

2.2 Ingredients:

Ecbolium Linguistrum , *Pavonia zeylanica*, *Ricinus communis*, *Zingiber officinale* ,*Alphinia officinarum* , *Vitex negundo* (Karunotchi) , S*permacose hispida* , *Vitex negundo* , ,*Allium sativum* (17).

2.3 Source of raw drugs:

The raw drugs for the preparation of medicine were procured from the raw drug shop at Tirunelveli, TamilNadu. The raw drugs are authenticated by the Pharmacognosist of Government Siddha Medical College &Hospital, Palayamkottai, Tamil Nadu.

2.4 Purification:

The ingredients of Karunkurinji chooranam were purified as per authenticated Siddha literature (18).

2.5 Preparation of KARUNKURINJI KUDINEER:

The ingredients were powdered in an iron mortar separately made into a coarse powder. The prepared Choornam (Powder) was stored in a clean, air-tight glass container.

2.6 Evaluation of Analgesic Activity-Acetic acid-induced Writhing test:

Animals:

The adult male albino mice weighing about 25-35 g were obtained from the animal house, K.M. College of Pharmacy, Madurai. The animals were housed under standard laboratory conditions (temperature 23 ± 2 ˚C) with 12 h dark and 12 h light cycles. The animals had free access to a standard dry pellet diet and tap water *ad libitum*. All procedures were approved by IAEC of K.M college of pharmacy, Madurai. IAEC no: **TNMGR/KMCP/96/2020**.

The given procedure was used to carry out the acetic-acid writhing test .[19,20,21] The albino rats were divided into four groups of each six animals. Group I served as Negative control receiving Distilled water. Group II-IV served as positive control groups respectively. Group II received Aceclofenac sodium 10mg/kg, Group III received 10mg/kg dose of Karunkurinji Kudineer, and Group IV received 20mg/kg dose of Karunkurinji Kudineer respectively (22,23). Then the

animals received an intraperitoneal injection of 0.1 ml of 0.6% acetic acid after 30 minutes. After that, the number of animal abdominal contractions throughout the following 30 minutes was recorded and the Percentage Analgesic Activity (PAA) was calculated by using the following formula (24).

PAA = ((C- CD)/CD) ×100

C = Mean of contractions count in animals treated with different doses of Siddha formulation karunkurinji kudineer and aceclofenac sodium

CD = Mean of contractions counts in animals served as the negative control.

2.7 Statistical analysis:

The results are reported as mean ± S.E.M. The statistical analyses were performed using a one-way analysis of variance (ANOVA). Group differences were calculated by post hoc analysis using Newmann keuls multiple range tests. For all tests, differences with values of $P<0.05$ were significant.

3. **Results:**

The results of the study demonstrated that the various dosages of the Siddha formulation karunkurinji kudineer significantly reduced pain in the animals. As seen in Table 1, the effects of the doses of 10ml and 20mg/Kg Karunkurinji kudineer on analgesic activity were significant and equivalent to those of aceclofenac sodium.

Table 1. Analgesic Effects of Karunkurinji kudineer on acetic acid-induced writhing test

Groups	**Treatment**	**(Number of writhing movements) (Mean ± S.E)**	**Percentage %**
Group I	Distilled water	37.2±2.3	-
Group II	aceclofenac sodium 10mg/kg	7.9±0.6	78.76%*a
Group III	10mg/kg karunkurinji kudineer	12.0±1.2	67.74%*a
Group IV	20mg/kg karunkurinji kudineer	11.6±0.8	68.81%*a

* (a) Values are significantly different from Toxic control G1 at $P<0.05$.

Discussion:

The analgesic effect of Karunkurinji kudineer was assessed using the anti-nociceptive model by acetic acid-induced technique. The writhing reaction caused by acetic acid is a model of visceral pain that is very helpful for testing analgesic medications. Several substances, including phenylquinine and acetic acid, can cause this reflex in animal studies (25). The writhing test, which has been demonstrated to be useful for the research of peripheral antinociceptive activity and was used as a chemical pain model, was used to measure the analgesic activity (26,27,28). In this experiment, intraperitoneal injection of acetic acid (0.6%) resulted in abdominal writhing.

Acetic acid raises the levels of PGE2 and PGF2 in peritoneal fluid (29). Animals respond to acetic acid by writhing because of the chemosensitive nociceptors being activated.

The acetic acid-induced writhing model causes inflammation, which in turn causes pain stimulus that causes tissue to release arachidonic acid. In animal models of pain, the Siddha formulation Karunkurinji kudineer showed considerable, dose-dependent antinociceptive efficacy. The analgesic effect demonstrated in pain modeling suggests that the Siddha formulation Karunkurinji Kudineer may have antinociceptive qualities that are peripherally and centrally mediated. The antinociceptive properties of Siddha formulation Karunkurinji Kudineer may be due to chemical components such as flavonoids, saponins, or phenolic substances. Additionally, it has been reported that the percentage decrease in the number of abdominal constrictions in acetic acid-induced animals serves as a measure of the degree of analgesia.

The mean number of abdominal constrictions or writhes was dramatically reduced in this study at doses of 10mg and 20mg/kg of Karunkurinji kudineer, respectively. Since it has been noted that any agent that reduces the number of writhing will demonstrate analgesia, preferably by inhibition of prostaglandin synthesis, a peripheral mechanism of pain inhibition, the analgesic effect of Karunkurinji kudineer seen in this experiment may be mediated through peripheral pain mechanism and/or through suppression of prostaglandin pathway.

Conclusion:

Karunkurinji kudineer has anti-nociceptive qualities that are likely mediated by inhibiting prostaglandin synthesis as well as central inhibitory processes. These properties may be useful for the management of pain and inflammatory ailments. Further study is necessary to identify the active compounds present in this extract and to elucidate the mechanisms involved in their analgesic properties.

Conflict of Interests:

The authors declare that there is no conflict of interest.

Funding:

None

REFERENCE:

1. SM. Raquibul Hasan Hossain, MM. Akter R., et al. Analgesic activity of the different fractions of the aerial parts of Commelina benghalensis Linn, International Journal of Pharmacology, 6(1): 2010, 63–67.
2. MI Ezeja, , YS Omeh, II Ezeigbo, and A Ekechukwu , Evaluation of the Analgesic Activity of the Methanolic Stem Bark Extract of *Dialium Guineense* (Wild), Annals of Medical & Health Sciences Research , 2011 Jan-Jun; 1(1): 55–62.
3. S. Banerjee, A. Mukherjee and TK. Chatterjee, Evaluation of analgesic activities of methanolic extract of medicinal plant Juniperus communis Linn, International Journal of Pharmacy and Pharmaceutical Sciences, 2012 Nov 4(5):547-550
4. R. N. Suresha, Siddamma Amoghimath, P. S. Vaibhavi, S. L. Shruthi, M. K. Jayanthi, and H. L. Kalabharathi , Evaluation of analgesic activity of perindopril in albino mice, 2014 Jul-Sep; 5(3): 129–133.
5. Merskey H, Bogduk N. Classification of chronic pain: Descriptions of chronic pain syndromes and definitions of pain terms, 2nd Ed, Seattle, Washington: IASP Press; 1994.
6. Mark J Millan. The induction of pain: an integrative review. Progress in Neurobiology. 1999; 57: 1-164.
7. Moritz A. The dangerous side effects of steroids, arthritis drugs, and NSAIDs,' Ener-Chi Wellness Center. 2011, http://www.ener-chi.com/thedangerous-side-effects-of-steroids-arthritis-drugsand-nsaids/

8. Farshchi A, Ghiasi G, Malek Khatabi P and Farzaei Hossein NA. Antinociceptive Effect of Promethazine in Mice. *Iran. J. Basic Med. Sci.* (2009) 12: 140-145.

9.Kannan Rajaram. T, Mohan raj. T, Textbook of Varmam ,2nd Edition,2017: 382,421-429.

10. Aoki M, Tsuji M, Takeda H, Harada Y, Nohara J, Matsumiya T and Chiba H. Antidepressants enhance the antinociceptive effects of carbamazepine in the acetic acid-induced writhing test in mice. *Europ. J. Pharmacol.* (2006) 550: 78-83.

11. M. Ashraful Alam, Nusrat Subhan,M. Abdul Awal,M. Shohidul Alam, Antinociceptive and anti-inflammatory properties of *Ruellia tuberosa* , Mymensingh, Mokaddez Sarder, Lutfun Nahar Pharmaceutical Biology , Mar 2009, 209-214 .

12. Bartolini, A. Galli, C. Ghelardini, et al., Antinociception induced by systemic administration of local anesthetics depends on a central cholinergic mechanism, Br J Pharmacol, 92(4): 1987, 711–721.

13. Abdulmalik IA, Sule MI, Yaro AH, Abdullahi MI, Abdulkadir ME, Yusuf H. Evaluation of analgesic and anti-inflammatory effects of ethanol extract of Ficus iteophylla leaves in rodents. Afr J Tradit Complement Altern Med. 2011;8(4):462-6.

14.Olufunmilayo O Adeyemi, Steve O Okpo, Orowo Okpaka., The analgesic effect of the methanolic extract of Acanthus montanus. J Ethnopharmacol. 2004; 90: 45–48.

15.Williamson EM, Okpako DT, Evans FJ. (1996). Pharmacological Methods in Phytotherapy Research. Volume 1. Selection, Preparation and Pharmacological Evaluation of Plant Materials.John Wiley: Chichester, 184–186.

16.Collier HO, Dinneen LC, Johnson CA, Schneider C. The abdominal constriction response and its suppression by analgesic drugs in the mouse. British J of Pharmacol & Chemothe 1968; 32:295-310.

Sarakku suthi Sei Muraigal(2005), Ist Ed, Department of Indian
System of Medicine and Homeopathy, Chennai. 1999
Sarakku suthi Sei Muraigal(2005), Ist Ed, Department of Indian
System of Medicine and Homeopathy, Chennai. 1999
Sarakku suthi Sei Muraigal(2005), Ist Ed, Department of Indian
System of Medicine and Homeopathy, Chennai. 1999

17. Murugesa Mudhaliyar C.S, Gunapadam- Mooligai 2nd edition: 69-77, 98-101,446-447,627-629,846-847.

18.Palm leaf manuscript Sarakku suthi sei muraigal, Tamil Maruthuva nool varisai-8,1st edition,2008 :6,12,13.

17. Sarakku suthi Sei Muraigal(2005), Ist Ed, Department of Indian
System of Medicine and Homeopathy, Chennai. 199

17. Sarakku suthi Sei Muraigal(2005), Ist Ed, Department of Indian
System of Medicine and Homeopathy, Chennai. 199Sarakku suthimuraigal **author name edition published year.**

19. Koster R, Anderson M, De Beer EJ. Acetic acid for analgesic screening. Federation Proc. 1959; 18:412.

20.Ranjan S, Jadon VS, Sharma N, Singh K, Parcha V, Gupta S and Bhatt JP, Anti-inflammatory and Analgesic Potential of Leaf Extract of Allium Stracheyi, Journal of Applied Sciences Research, 6(2), 2010, 139-143.

21. Das B K, Al-Amin MM, Russel SM, Kabir S, Bhattacherjee R, Hannan JM. Phytochemical screening and evaluation of analgesic activity of Oroxylum indicum. Indian J Pharm Sci. 2014;76(6):571-5.

22. Suseem SR, Mary Saral A, Neelakanda Reddy P, Marslin Gregory. Evaluation of the analgesic activity of ethyl acetate, methanol and aqueous extracts of Pleurotus eous mushroom. Asian Pac J Trop Med. 2011; 117-120.

23. Chakroborty A, Devi R K B, Rita S, Sharatchandra Kh, Singh Th I. Preliminary studies on anti-inflammatory and analgesic activities of Spilanthes acmella in experimental animal models. Indian J Pharmacol. 2004; 36(3):148-150. 17.

24.Delporte C, Backhouse N, Inostroza V, Aguirre M C, Peredo N, Silva X, Negrete R, Miranda H F. Analgesic activity of Ugni molinae (murtilla) in mice models of acute pain. J Ethnopharmacol. 2007; 112:162–165. 18.

25.Domaj MI, Glassco W, Aceto MD and Martin BR. Antinociceptive and pharmacological effects of metanicotina, a selective nicotine agonist. *J. Pharmacol. Exp. Ther*. (1999) 291: 390-398.

26.Abdollahi M, Karimpour H and Monsef-Esfehani HR. Antinociceptive effects of Teucrium polium L. total extract and essential oil in mouse writhing test. *Pharmacol. Res.* (2003) 48: 31-35.

27.Golshani S, Karamkhani F, Monsef-Esfehani HR and Abdollahi M. Antinociceptive effects of the essential oil of Dracocephalum kotschyi in the mouse writhing test. *J. Pharm. Pharm. Sci.* (2004) 7: 76-79.

28.S. Shulan, T. Wang, JA. Duan, W. Zhou, YQ. Hua, YP. Tang, L. Yu and DW. Qian, Anti-inflammatory and analgesic activity of different extracts of Commiphora myrrh. J Ethnopharmacol, 134: 2011, 251–8.

29. Krasteva I, Momekov G, Zdraveva P, Konstantinov S and Nikolov S. Antiproliferative effects of a flavonoid and saponins from Astragalus hamosus against human tumor cell lines. *Pharmacognosy Magazine* (2008) 4: 269.