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A Comparative Study on the Effect of Three Oil Products of Traditional Medicine: Nerium Oleander, Ginger and Chamomile on Resistance to Cold in Rats

Nafiseh Hosseini Yekta[1], Damoon Ghofrani Tabari[1]*, Mohammad Tahvilzadeh[1], Ehsan Nassireslami[2], Sayid Mahdi Mirghzanfari[1]

[1] Department of Persian Medicine, Faculty of Medicine, AJA University of Medical Sciences, Tehran, Iran
[2] Department of Pharmacology and Toxicology, Faculty of Medicine, AJA University of Medical Sciences, Tehran, Iran

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ABSTRACT

Introduction and goal: Increasing resistance to cold weather conditions is very important for military forces located in these areas, mountain climbers and people living in these areas. One of the most useful methods is to benefit from traditional medicine and the consumption of medicinal plants that are of warm quality and can improve the resistance to cold. In this research, we tried to study the effect of medicinal plants oil of Nerium Oleander, Ginger and Chamomile on the rates' cold resistance. Materials and methods: In this research, rats were our animal model. They were divided into seven experimental groups and the effect of the oils of olive, sesame, chamomile, ginger, and oleander were studied using experimental induction of frostbite through cold water immersion method. Results: According to the results, the average times of resistance to cold are significant in the presence of oils and without oil. Among the oils used in this research, Ginger produced the highest cold resistance in rat. Conclusion: The results of this research showed that the use of oil from plants that have a warm and dry quality such as ginger can increase the resistance to cold.

Key words: Traditional Medicine, Frostbite, Nerium Oleander, Ginger, Chamomile.

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***Corresponding author**: Damoon Ghofrani Tabari
e-mail: d_ghofrani@yahoo.com
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INTRODUCTION

Frostbite occurs when the tissue is exposed to cold temperature and leads to freezing of the tissue and sometimes to the tissue disability and loss. Soldiers stationed in very cold climates, mountain climbers climbing highlands, and homeless people exposed to cold weather are examples of people who may become frostbitten [1]. Exposure of the tissue or limb to very cold temperature results in vasoconstriction, decreased blood flow, and ultimately blood clotting (thrombosis) in the capillaries [2, 3]. At the cellular level, the formation of intracellular ice crystals causes changes in protein and cell wall membrane destruction [4]. When the temperature of the tissue decreases slowly, the extracellular water is crystallized and causes cell dehydration [5]. Due to this effect, intracellular electrolyte concentrations change and cause changes in the structure of the protein. Cell dehydration and capillary obstruction lead to the tissue ischemia, necrosis, severe ulcers, and loss of it [6]. Therefore, increasing the power of forces and people located in cold regions is always very important. Among the many traditional and modern methods of resistance to frostbite, the use of medicinal plants is very important in the treatment of various types of diseases [7]. It seems that some medicinal plants which are of warm quality and may increase resistance to frostbite by increasing body metabolism are an effective treatment to cope with frostbite. Among these plants are Nerium oleander, Ginger and

Chamomile, which have warm and dry quality [8]. The purpose of this research is to study a method for increasing the body's ability to cope with cold temperature using warm-quality medicinal plants oil. Accordingly, using the oil of medicinal plants and inducing cold pain, the response of the animal (model) to cold pain will be examined.

MATERIALS AND METHODS

Extracting oil from Ginger, Oleander and Chamomile

In order to extract Ginger, Oleander and Chamomile oils, we used the standard protocol in traditional medicine. We break fresh ginger and transfer 5 ml of its extracted water into beaker and pour 20 cc of sesame oil on it and boil it on the heater with a minimum of boiling heat, until the water evaporates and the oil is remained [9].

15.6 g leaves and flowers of Oleander were separated and shed into beaker. 78 g of distilled water were added to be boiled on heater and cooked well. The remaining liquid was then measured and added to it by half the olive oil. Then the liquid was boiled to be evaporated all of its water and remained only oleander oil.

Dry Chamomile was soaked with water at a ratio of 1 to 5 and kept for 24 hours, then it was boiled for remaining up to a quarter of it, and its juice was completely left; finally, sesame oil was molded by its size and mildly heated to allow only oil to remain.

Animal test stage

In this stage, 42 naive rats were used in 7 experimental groups with 6 repetitions per care. Animals were kept under standard conditions and at ambient temperature of 20-25 ° C, relative humidity of 90% and light cycles of 21 hours of darkness and 21 hours of lightness; standardized concentrate for feeding rats was used by Ad-Libitum method. The water placed in special containers was given to the animal [10].

In this study, 7 experimental groups were examined as follows:

1- Control group (without oil and without massage)
2- Massage group without anointment
3- Massage group with olive oil
4- Massage group with sesame oil
5- Massage group with chamomile oil
6- Massage group with ginger oil
7- Massage group with oleander oil.

The animal's tail was massaged for 2 minutes by the desired oil, and after 5 minutes of massage with oil, the tail was placed in water at 5, 10 and 15 degrees Celsius [11]. In this method, the rat was taken slowly and kept for a few seconds for adaptation and reduced scrambling, then the tail of the animal (5 cm in the end portion) was immersed in a rectangular container, whose temperature was kept constant by adding ice pieces. A period of time of immersion of the tail (or, in other words, the time it takes for the rat to pull off the tail of the container) was manually recorded (with precision of 0.1 second). The period of time of its breaking off is 20 seconds. In this study, since sesame oil and olive oil were used to extract oil from chamomile, oleander and ginger, in the animal testing stage, we benefited from pure olive oil and pure sesame oil as control factors.

In this study, SPSS version 22 was used to analyze the data. All ethical considerations were considered for laboratory animals.

RESULTS

In the present research, Nerium oleander, Ginger and Chamomile oils of warm and dry quality were used to evaluate and compare their effect on resistance to cold in rats. All data resulting from experimenting rats were collected in 7 experimental groups and were presented in [Table 1].

Table 1: Effect of Oils of Olive, Sesame, Chamomile, Ginger, and Oleander on the rats' resistance to cold-water

Cares	Water temperature		
	5°C	10°C	15°C
Without intervention (control)	113.14^{c}	19.57^{b}	20.56^{b}
Massage alone	12.18^{c}	18.66^{b}	20.84^{b}
Olive	18.22^{bc}	23.39^{ab}	20.16^{b}
Sesame	18.53^{bc}	20.16^{ab}	22.19^{ab}
Chamomile	22.82^{ab}	25.67^{ab}	24.23^{ab}
Ginger	25.52^{a}	28.97^{a}	30.19^{a}
Oleander	22.85^{ab}	23.55^{ab}	22.12^{ab}
SEM[1]	0.312	0.878	0.826
P-value	< 0.0001	0.0094	0.0084

$^{a-c}$ Means of every column for any factor that is not of common letter do not have a significant difference (P-value>0.05). [1]Mean standard error

The results showed that the total mean calculated times in resistance to cold test are significant in

the presence of oils under study and without any oil in each column of Table 1. However, according to Table 1, there was not observed any significant difference in the mean time for each factor that do not have a common letter (P> 0.05). In other words, there is no significant difference between cold resistance test in presence of olive oil and chamomile oil in terms of mean time, but the difference between olive oil and sesame oil is quite significant. The maximum time of cold resistance in this research was when Ginger oil was used to massage the rat's tail, before being placed in water at 5, 10 and 15 ° C.

DISCUSSION

Increasing the power of military forces and people living in cold regions has always been of great importance. Because the damages caused by cold are considered as a major problem for military operations in cold weather [12]. There are various ways to improve resistance to cold weather conditions. Among these, it seems that the use of medicinal plants that are of warm quality can be one most effective and natural method without side effects [13]. Medicinal plants have always had a special place in human life; they are considered as a therapeutic option in many developed and developing countries [14]. Plants are now used to make drugs and 30% of medicinal products are obtained from plants [15]. Herbal medicines have received special attention because they have less toxicity than their synthetic equivalents and have less side effects. The effective ingredients in the plant is one of the most important factors in the use of herbal medicines [16]. Based on studies, despite the fact that traditional medicine has referred to the consumption of ginger, chamomile and oleander oils for increasing resistance to cold, no scientific research on the use of these oils has carried out as a natural way to cope with frostbite. Therefore, in this research, the above-mentioned herbal oil was used for the first time.

Nerium oleander has a great medicinal consumption. Various studies have shown the therapeutic effects of this plant, such as anti-cancer, anti-stress, anti-inflammatory and analgesic effects, and immunosuppression [17]. In this study, it was shown that, using Nerium oleander oil, to increase the response of the animal to cold pain, the response time of the animal at 5 ° C was 9.71 seconds higher than the non-interventional animal (control sample).

Ginger is used throughout the world as a mouthwatering flavor. In animal models, both antioxidant and androgenic activity of this plant have been shown. All compounds of Zingerone, Gingerdiol, Zingibrene, gingerols have an antioxidation activity. In addition, Yang et al reported in 2007 that Ginger can significantly improve resistance to frostbite. In this research, Ginger produced the highest resistance to cold in rat compared to other plant oils [18]. The Ginger oil used in this research increased by 38.32 seconds the resistance to cold in rat compared to the control sample at 5 ° C, which was higher than other herbal oils used in this research.

CONCLUSION

According to the results of this research, it can be stated that the use of vegetable oil from plants that are of warm and dry qualities can increase the resistance to cold in people who are located in these areas.

REFERENCES

1. Rezaeizadeh H, Alizadeh M, Naseri M, Ardakani MS. The Traditional Iranian Medicine Point of View on Health and. Iranian J Publ Health. 2009;38(1):169-72.
2. Posadzki P, Watson LK, Alotaibi A, Ernst E. Prevalence of use of complementary and alternative medicine (CAM) by patients/consumers in the UK: systematic review of surveys. Clinical Medicine. 2013 Apr 1;13(2):126-31.
3. Posadzki P, Watson LK, Alotaibi A, Ernst E. Prevalence of use of complementary and alternative medicine (CAM) by patients/consumers in the UK: systematic review of surveys. Clinical Medicine. 2013 Apr 1;13(2):126-31.
4. Posadzki P, Ernst E. Prevalence of CAM use by UK climacteric women: a systematic review of surveys. Climacteric. 2012 Jan 1;16(1):3-7.
5. World Health Organization. WHO traditional medicine strategy: 2014–2023. Geneva: World Health Organization; 2013.
6. Mills S, Bone K. Principles and practice of phytotherapy. Modern herbal medicine. Churchill Livingstone; 2000.
7. Prasanna R, Harish CC, Pichai R, Sakthisekaran D, Gunasekaran P. Anti-cancer effect of Cassia auriculata leaf extract in vitro through cell cycle arrest and induction of apoptosis in human breast and larynx cancer cell lines. Cell

biology international. 2009 Feb 1;33(2):127-34.
8. Chen CY, Liu TZ, Liu YW, Tseng WC, Liu RH, Lu FJ, Lin YS, Kuo SH and Chen CH.6- Shogaol (alkanone from ginger) induces apoptotic cell death of human hepatoma p53 mutant mahlavusubline via an oxidative stress-mediated caspase-dependent mechanism. J. Agric. Food Chem. 2007; 55: 948 - 54.
9. Linzhong LJ. Mechanism of Chinese Medicinal in the Protection of Acute Lung Injury. Journal of Shaanxi College of Traditional Chinese Medicine. 2009;6:046.
10. Jeong SE, Lee Y, Hwang JH, Knipple DC. Effects of the sap of the common oleander Nerium indicum (Apocyanaceae) on male fertility and spermatogenesis in the oriental tobacco budworm Helicoverpa assulta (Lepidoptera, Noctuidae). Journal of Experimental Biology. 2001 Nov 15;204(22):3935-42.
11. Al-Farwachi MI. In vivo and in vitro Immunmodulatory Activities of Nerium oleander Aqueous Leaf Extract in Rabbits. J Anim Vet Adv. 2007 Sep 1;14:1047-50.
12. Langford SD, Boor PJ. Oleander toxicity: an examination of human and animal toxic exposures. Toxicology, 1996 May; 109(1): 1-13.
13. Allchorne AJ, Broom DC, Woolf CJ. Detection of cold pain, cold allodynia and cold hyperalgesia in freely behaving rats. Molecular pain. 2005 Dec;1(1):36.
14. Weatherley-White RC, Sjostrom B, Paton BC. Experimental studies in cold injury. Journal of Surgical Research. 1964 Jan 1;4(1):17-22.
15. Smith JA, Madden T, Vijjeswarapu M, Newman RA. Inhibition of export of fibroblast growth factor-2 (FGF-2) from the prostate cancer cell lines PC3 and DU145 by anvirzel and its cardiac glycoside component, oleandrin1. Biochemical pharmacology. 2001 Aug 15;62(4):469-72.
16. Sekiwa Y, Kubota K, Kobayashi A. Isolation of novel glucosides related to gingerdiol from ginger and their antioxidative activities. Journal of agricultural and food chemistry. 2000 Feb 21;48(2):373-7.
17. Kamtchouing P, Fandio GM, Dimo T, Jatsa HB. Evaluation of androgenic activity of Zingiber officinale and Pentadiplandra brazzeana in male rats. Asian Journal of Andrology. 2002 Dec 1;4(4):299-302.
18. YANG J, WANG ZJ, LI HW, QIAN H. The effect of different drying methods on 6-gingerol of ginger. China Food Additives. 2012;6:016.
19. Ye H. Impact of Mindfulness-Based Stress Reduction (MBSR) on Students' Social Anxiety: A Randomized Controlled Trial. NeuroQuantology. 2017 Dec 21;15(4).
20. Zhang Z. Evaluating the Effectiveness of an Intervention Program to Regulate Cognitive Emotion of Patients with Type 2 Diabetes. NeuroQuantology. 2017 Dec 21;15(4).
21. Song W. Effects of a Training Program on Lifestyle Modification for Adolescents Identified with Overweight. NeuroQuantology. 2017 Dec 22;15(4).