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Research Article

Effect of Different Varieties of Jinfeicao Paste Topical Anti-inflammatory Analgesic

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Abstract: Objective: To investigate the different varieties of Jinfeicao paste topical anti-inflammatory and analgesic effects. Methods: The effects on formalin induced pain in mice, the mouse hot plate induced pain and other pharmacological experiments and making egg-induced rat paw edema model, xylene-induced mouse ear edema model was boiling grass paste topical anti-gold inflammatory and analgesic effects. Results: Jinfeicao paste can reduce the impact of formaldehyde in mice pain, increase the pain threshold in mice, significantly reduced ear swelling in mice, reducing the rat paw swelling degree. Conclusion: Different varieties of Jinfeicao Jinfeicao paste with a good anti-inflammatory topical analgesic effects.

Keywords: Anti-inflammatory and analgesic, jinfeicao, model, topical

INTRODUCTION

Jinfeicao strip leaves Compositae Inula Inula linariifolia Turcz. Or Inula Inula japonica Thunb. Of dry ground. Jinfeicao inquiry Pharmacopoeia has been recorded outside the rule boils swollen drugs, topical right amount of fresh goods, Daozhi coated surface. Chinese Materia Medica records: blood only gold sores, swollen boils poison treatment (Miao *et al*., 2014a). "Nanjing folk herb" and reads: Miao, dampness, Sida, swelling, swollen boils poison divergent treatment of medical functions for swelling, heat, detoxification, civil widely used topical swelling and pain, modern research shows gold boiling herbs rationale for anti-inflammatory effect, analgesic, antipyretic, regulate immune function, liver and other effects, the study observed Jinfeicao paste formaldehyde experiments in mice affects pain, hot plate induced pain in mice, xylene-induced ear edema in mice experiments, egg white rat paw edema induced to further explore the Jinfeicao paste topical pharmacological and functional role (Shi *et al*., 2011), which proves Jinfeicao topical anti-inflammatory and analgesic function.

MATERIALS

Animals: Clean KM mice, weighing 18~22 g, male, provided by Experimental Animal Center of Hebei Province, Certificate of Conformity 110120; clean KM mice, weighing 18~22 g, female, provided by the Experimental Animal Center of Hebei Province, qualified No. 110120; clean KM mice, weighing 18~22 g, male, provided by experimental Animal Center of Hebei Province, Certificate of Conformity 1, 110, 120; clean grade wistar rats weighing 180~220 g, male, by the experimental Animal Center of Hebei Province provided, Certificate of Conformity 1,110,123; clean grade wistar rats weighing 180~220 g, male and female, provided by the experimental Animal Center of Hebei Province, Certificate of Conformity 1,110,123; laboratory Certificate of Conformity: SYXK (Henan) 2010-001.

Instrument: AR1140/C electronic analytical balance, Ohaus (Shanghai) Company production; micropipette, Shanghai refinement biochemical reagents Instrument Co; metal puncher, Shenyang Pharmaceutical Co., Ltd. Bose company; WFZ UV2000 UV Vis, Nika (Shanghai) instrument Co; PV-200 rat paw analyzer, Chengdu Tai Sheng Technology Co.; YLS-6A thermal plate detector, Shandong Medical science equipment station production; TDL-40B centrifuges, Shanghai Anting Scientific Instrument Factory; JYL-A100 Joyoung cooking machine: Nine Yang Co., Ltd. Production.

Drugs and reagents: Jinfeicao, collected from Baiyun Mountain Luoyang, Henan College of Health and by the Department of identified drug Compositae strip leaves Inula Inula linariifolia Turcz or Inula Inula japonica Thunb; According to the 2010 edition of Chinese Pharmacopoeia processing methods to remove impurities spare; Inula fresh products (fresh goods strip leaves Inula) 100 g of water 150 mL, with a cooking machine grinding, Inula (Inula leaf fresh goods section) concentrations fairly dry goods 0.25 g/mL; 100 g Inula

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(Inula leaf fresh goods section) with 283 mL of water cooking machine grinding, Inula (Inula leaf fresh goods section) concentrations fairly dry goods 0.15 g/mL, the drug filling after refrigerated, fresh products Inula (Inula leaf fresh goods section) moisture content of 50%. Jingwanhong, Tianjin Darren Hall Jingwanhong Pharmaceutical Co, lot number 211717; xylene, Tianjin Ou Bokai Chemical Co., lot number 20110510; chloral hydrate, Tianjin Kermel Chemical Reagent Development Center, batch number 20101018; sodium Chloride Injection, Henan is too long Pharmaceutical Co., Ltd. production, batch number 11082465; formaldehyde, Yantai City, both Chemical Co, lot number 20100308.

EXPERIMENTAL METHODS

Mice induced pain formaldehyde: Take mice weighing 18~21 g 60, male, were randomly divided into six groups of mice were given the right posterior dorsal topical application of large and small doses of inulin and large and small doses of strip leaves Inula paste (0.05 g/foot, 0.03 g/foot, 0.25 g/mL, 0.15 g/mL, 0.2 mL/foot), Jingwanhong ointment (thickness 2 mm, 0.2 g cream/foot), saline coating the same amount of 0.9% sodium chloride injection (right amount of cotton wool adsorption), two layers of gauze after the applicator, after the plastic wrap and tape securely. 10 min after untied, with 0.9% sodium chloride injection drug use local clean, dry cotton wool double hind allow freedom of movement in mice 10 min; then to the back of each mouse was injected right hind 0.05 mL of 10% formaldehyde and immediately observe record mouse dorsal bite first appeared Tim incubation, add bite times within 5 min and 10 min (Shao *et al*., 2011a).

Pairs of hot plate induced pain in mice: Take weight 18~21 g 100 healthy mice, female. Before the experiment first on a hot plate meter (55±0.5°C) screening normal pain threshold in mice, where the pain threshold is greater than 30 sec, or less than 3 sec, were not abandoned; selection of qualified pain threshold in mice 60, according to the pain threshold in mice size randomly divided into six groups of mice were given double toe after applying large and small doses of inulin and large and small doses of strip leaves Inula paste (0.05 g/foot, 0.03 g/foot, 0.25 g/mL, 0.15 g/mL, 0.2 mL/foot), Jingwanhong ointment (thickness 2 mm, 0.2 g cream/foot), applying the same amount of saline 0.9% sodium chloride injection (right amount of cotton wool adsorption), after two applicator gauze and tape fixed after plastic wrap. 10 min after untied, with 0.9% sodium chloride injection drug use local clean, dry cotton wool double hind allow freedom of movement in mice 5 min. After the administration of 5, 30, 60, 90 min, respectively hot plate meter measured the pain threshold in mice again and increase the pain threshold value is calculated. Pain threshold value = pain threshold after administration at different times-the same pain threshold in mice prior to administration, where the pain threshold when the value is negative, press 0 count (Miao *et al*., 2006).

Induced mouse ear swelling paraxylene: Take a healthy body weight is 18~21 g 60 mice were randomly divided into six groups, each mouse ear topical application of large and small doses of inulin and large and small doses of strip leaves Inula paste (0.25 g/mL, 0.15 g/mL, 0.05 mL/ear), Jingwanhong ointment (0.05 mL/ear), applying the same amount of saline 0.9% sodium Chloride Injection and even within one hour Tu 6 times total and topical for 0.3 mL/ear; applicator 1h, with warm saline and then wipe with a dry cotton wool ear still dry. 10 min after the right ear Tu-xylene 0.04 mL (both positive and negative smear), xylene proinflammatory 10 min and 2 h after each group were coated with the appropriate amount of drug again. Mice were sacrificed at 4 h after coating xylene, warm saline prior to sacrifice access to clean dry cotton ear after the medication. Cut ears, aligned, remove the binaural ear piece with 8 mm hole puncher, rapid analytical balance, the difference between the weight of the ears for swelling.

Induced rat paw edema of egg white: The rat 60, male, 180~220 g. Were randomly divided into six groups, the first with plantar Measurer normal rats right paw volume and adjust the position of the rat crossed ankle, so the normal rat paw volume at about 1 mL. Then give each paw after double-coated large and small doses of inulin and large and small doses of strip leaves Inula paste (0.05 g/foot, 0.03 g/foot, 0.25 g/mL, 0.15 g/mL, 0.5 mL/foot, the right amount of cotton wool adsorption), Jingwanhong ointment (thickness 2 mm, 0.3 g cream/foot), applying the same amount of saline 0.9% sodium chloride injection (right amount of cotton wool adsorption), painted after the drug two layers of gauze and tape securely covered with plastic wrap after. 30 min after untied, with 0.9% sodium chloride injection drug use local clean, dry cotton wool double hind. After each mouse was injected subcutaneously right paw freshly prepared 10% fresh eggs supernatant 0.1 mL/foot. Then right hind foot of the rats were given appropriate medication, administered as above, holding time is 20 min. After the egg white in to 30, 60, 120, 180, 240, 300, 360 min, respectively after the rat right paw paw volume meter measuring and calculating the right rear paw swelling (paw swelling egg white = Right after injection, respectively paw volume-right before injection after egg white paw volume).

Statistical methods: Data analysis was performed using the statistical data of the statistical package SPSS 17.0 for windows, among the groups were compared using ANOVA analysis, measurement data as mean ± standard deviation (± s) indicate (Shao *et al*., 2011b).

RESULTS

Formalin-induced pain in mice impact: From the Table 1 it can be seen, compared with the saline group, large and small groups and large doses of Inula paste, paste a small dose group could strip the leaves inulin significantly increased in mice licking the instep of the incubation period ($p<0.01$), significantly reduced the number of times 5 min and 10 min licking dorsum of mice ($p<0.01$).

Pairs of hot plate induced pain in mice: From the Table 2 it can be seen, with the saline group, the high and low dose group Inula paste, large and small dose group and strip the leaves Inula paste Jingwanhong group could significantly increase after administration of 5, 30, 60 min, respectively pain threshold ($p<0.01$); high-dose group Inula paste, large and small doses of strip leaves Inula paste group, low-dose group and strip the leaves Inula paste Jingwanhong group were after 90 min administration can significantly improve the pain threshold ($p<0.01$), low-dose group can significantly improve Inula paste 90 min after administration of pain threshold ($p<0.05$).

Induced mouse ear swelling paraxylene: From the Table 3 it can be seen: with the saline group, the high and low dose group Inula paste, large and small dose group and strip the leaves Inula paste Jingwanhong group can significantly reduce the ear swelling in mice degree ($p<0.01$).

Induced rat paw edema of egg white: From the Table 4 it can be seen, with the saline group, the injected egg 30 min, large and small doses of Inula paste group and large and small pieces of each dose group and leaf paste Inula Jingwanhong group can significantly reduce egg-induced rat paw edema degree ($p<0.01$); injected egg 60min, large and small dose and low-dose group Inula paste Inula strip leaves egg white paste group can significantly reduce the degree of induced paw edema ($p<0.05$), Jingwanhong groups can significantly reduce the degree of egg-induced paw edema in rats ($p<0.01$); injected egg white 120 min, Inula paste large dose group can significantly reduce the degree of egg white rat paw edema ($p<0.05$), Jingwanhong groups can significantly reduce the degree of egg-induced paw edema in rats ($p<0.01$); injected egg white 180 min, high-dose group and paste Inula Jingwanhong group can significantly reduce induced large egg white rat paw edema degree ($p<0.01$), low-dose strip leaves Inula paste group can significantly reduce the degree of egg-induced paw edema in rats ($p<0.05$); injected egg white

Table 1: Jinfeicao paste topical formalin induced pain in mice impact ($\bar{x} \pm s$, n = 10)

		At different times after dosing frequency licking	
Groups	First licking latency (s)	Within 5 min	Within 10 min
Saline group	5.7±2.6	23.8±1.5	25.9±1.7
Jingwanhong group	18.5±2.1**	14.5±4.5**	17.0±4.9**
Inula paste large dose group	19.7±1.9**	12.4±3.3**	13.5±2.8**
Low-dose group Inula paste	17.2±3.6**	19.4±3.5**	21.8±3.3**
Article leaf paste large dose group Inula	18.7±2.6**	15.5±2.9**	16.9±2.7**
Article leaf paste Inula small dose group	15.6±3.7**	17.0±3.9**	19.0±4.1**

Compared with the saline group, ** $p<0.01$

Table 2: Jinfeicaopaste topical pain induced in mice on a hot plate ($\bar{x}$ ±s, n = 10, s)

		At different times of pain threshold (increased value) after administration			
Groups	Pain threshold before administration	5 min	30 min	60 min	90 min
Saline group	18.8±3.0	19.2±2.2 (0.8±0.8)	20.4±2.8 (1.8±2.3)	20.8±3.1 (2.0±1.9)	20.0±2.9 (1.5±1.8)
Jingwanhong group	18.9±5.9	26.4±5.0 (7.2±3.2)**	28.6±4.9 (9.7±3.4)**	31.6±6.9 (12.7±6.2)**	32.6±8.3(13.7±9.0)**
Inula paste large dose group	18.5±3.3	24.4±2.3 (5.8±1.6)**	25.5±2.4 (7.0±1.5)**	26.3±3.6 (7.8±1.7)**	25.7±3.4 (7.2±1.7)**
Low-dose group Inula paste	19.7±4.6	23.2±4.6 (3.5±0.9)**	24.8±4.4 (5.1±1.5)**	25.4±4.3 (5.6±1.6)**	24.5±4.0 (4.7±1.5)*
Article leaf paste large dose group Inula	19.1±3.8	26.7±3.4 (7.6±1.4)**	27.9±3.2 (8.8±2.2)**	28.8±2.9 (9.7±1.8)**	28.7±3.1(10.0±2.2)**
Article leaf paste Inula small dose group	19.8±1.9	25.2±1.7 (5.5±1.6)**	27.2±2.4 (7.5±2.8)**	27.1±1.8 (7.5±2.1)**	26.0±1.6 (6.3±2.0)**

Compared with the saline group, *$p<0.05$; **$p<0.01$; Figures in brackets for pain threshold value

Table 3: Jinfeicao paste induced mouse ear swelling paraxylene ($\bar{x}$ ±s)

Groups	n	Swelling (mg)
Saline group	10	7.4±0.7
Jingwanhong group	10	3.1±1.1**
Inula paste large dose group	10	2.4±1.1**
Low-dose group Inula paste	10	3.4±1.6**
Article leaf paste large dose group Inula	10	3.2±1.3**
Article leaf paste Inula small dose group	10	2.9±1.9**

Compared with the saline group, **$p<0.01$

Table 4: Jinfeicao on egg-induced rat paw edema impact ($\bar{x}$ ± s, n = 10)

Groups	To normal before the egg white paw volume (mL)	To egg white paw edema volume after different times (mL) (swelling) 30 min	60 min	120 min
Saline group	1.00±0.04	1.58±0.03 (0.58±0.04)	1.54±0.07 (0.53±0.07)	1.50±0.07 (0.46±0.07)
Jingwanhong group	0.99±0.03	1.41±0.08 (0.43±0.09)**	1.38±0.07 (0.39±0.08)**	1.32±0.07 (0.34±0.08)**
Inula paste large dose group	1.03±0.03	1.52±0.05 (0.49±0.05)**	1.48±0.05 (0.45±0.05)*	1.35±0.08 (0.33±0.09)*
Low-dose group Inula paste	1.01±0.03	1.51±0.05 (0.50±0.04)	1.48±0.04 (0.47±0.04)	1.44±0.08 (0.43±0.05)
Article leaf paste large dose group Inula	0.99±0.03	1.52±0.06 (0.53±0.07)	1.50±0.09 (0.50±0.10)	1.40±0.08 (0.41±0.09)
Article leaf paste Inula small dose group	0.99±0.03	1.53±0.07 (0.54±0.07)	1.46±0.05 (0.47±0.05)*	1.40±0.05 (0.40±0.06)

Groups	To egg white paw edema volume after different times (mL) (swelling) 180 min	240 min	300 min	360 min
Saline group	1.37±0.06 (0.36±0.05)	1.31±0.04 (0.30±0.05)	1.25±0.04 (0.24±0.06)	1.18±0.08 (0.18±0.07)
Jingwanhong group	1.25±0.05 (0.27±0.06)**	1.16±0.07 (0.18±0.08)**	1.12±0.07 (0.13±0.08)**	1.08±0.06 (0.09±0.07)**
Inula paste large dose group	1.28±0.06 (0.26±0.06)**	1.22±0.06 (0.19±0.06)**	1.16±0.05 (0.13±0.05)**	1.08±0.03 (0.05±0.03)**
Low-dose group Inula paste	1.37±0.03 (0.37±0.05)	1.29±0.05 (0.28±0.06)	1.23±0.03 (0.23±0.03)	1.12±0.02 (0.11±0.03)**
Article leaf paste large dose group Inula	1.31±0.06 (0.32±0.07)	1.26±0.06 (0.27±0.08)	1.15±0.08 (0.15±0.08)**	1.10±0.07 (0.11±0.07)**
Article leaf paste Inula small dose group	1.30±0.05 (0.31±0.06)*	1.22±0.05 (0.23±0.06)*	1.14±0.04 (0.14±0.04)**	1.07±0.03 (0.07±0.03)**

With the saline group: **p<0.01,*p<0.05

240 min, high-dose group Inula paste and Jingwanhong groups can significantly reduce the degree of egg-induced paw edema in rats (p<0.01), low-dose strip leaves Inula paste group can significantly reduce the degree of egg-induced paw edema in rats (p<0.05); injection egg white 300 min, Inula paste large dose group, large and small dose group and strip the leaves Inula paste Jingwanhong groups can significantly reduce the degree of egg-induced paw edema in rats (p<0.01); injected egg white 360 min, large and small doses of Inula paste group, large and small pieces of each dose group were leaf paste Inula and Jingwanhong group can significantly reduce the degree of egg-induced paw edema in rats (p<0.01).

DISCUSSION

Varieties of traditional Chinese medicine for more sources are the corresponding experimental study pharmacology of each variety of sources, can provide more accurate information for topical medicine function (Miao *et al*., 2014b). Jinfeicao in Chinese Materia Medica records: blood only gold sores, swollen boils cure poison. "Nanjing folk herb" and reads: Miao, dampness, Sida, swelling, divergent. USP also documented outside the rule boils swollen drugs, topical right amount of fresh goods, Daozhi coated surface. According to the clinical application features Jinfeicao, we observed a Jinfeicao paste topical anti-inflammatory analgesic, according to pharmacopoeia included Jinfeicao varieties (Article leaf inulin and inulin) were prepared paste, study the topical anti-inflammatory and analgesic characteristics (Liu *et al*., 2012).

The human body's most basic pathological processes and protective response to injury is that the inflammatory response to sexual stimulation, many common pathological basis of disease is a different type of inflammation, including biological, chemical and physical causes of disease (Miao *et al*., 2013).

Article from Inula paste on formaldehyde induced pain in mice of experimental, the influence of pain in mice induced by hot plate xylene induced mouse ear swelling experiment and egg white induced rat paw swelling experiment results show that jinfeicao is topical analgesic and anti-inflammatory function.

The results of this experiment showed that large doses of inulin pastes and high-dose strip leaves bindweed paste formaldehyde can significantly reduce pain in mice; hot plate induced pain showed, large and small and large doses of inulin pastes small doses strip leaves bindweed paste raise a significant effect on pain threshold in mice; xylene induced pain showed, large and small doses of inulin pastes and large, low-dose strip leaves bindweed paste obvious effect of pain relief; high-dose and low-dose group Inula paste strip leaves Inula reduce egg white paste group rat paw edema was excellent degree of efficacy, to reduce rat paw edema effect is remarkable. Tip of different varieties of Jinfeicao paste has a good anti-inflammatory and analgesic effects, dose-related, which can effectively alleviate the symptoms of clinical throat (Miao *et al*., 2014c). In this study, the clinical Jinfeicao outside for swollen boils poison provides pharmacology, clinical swollen boils poison on the rule provides a simple method for.

REFERENCES

Liu, S.Y., M. Bai, Y.L. Yang and M.S. Miao, 2012. Study on anti-inflammatory effect of external therapy of sodium sulfate. Chinese J. Tradit. Chinese Med. Pharm., 2(27): 312-315.

Miao, M.S., Y.Y. Xu, J.J. Shi and X.N. Ji, 2006. Anti-inflammatory effect of Aikuiling liquid: An animal experiment. Chinese J. Clin. Rehabil., 10(47): 101.

Miao, M.S., X.X. Zhang and W. Wu, 2013. Effect of herba leonuri on pruritus and eczema animal models. Tradit. Chinese Drug Res. Clin. Pharm., 24(6): 540-543.

Miao, M.S., B.L. Cheng and Y.P. Chen, 2014a. Bitter almond oil puste external influence on rat guinea pig model of prurius. Mod. Eng. Solut. Ind., 4: 1343.

Miao, M.S., S.Y. Yu, R.R. Wei, 2014b. Experimental study on anti-inflammatory and analgesic of clematis. Lishizhen Med. Mater. Med. Res., 25(8): 1836-1839.

Miao, M., S. Tian, M. Bai, S. Cao and J. Taoyin, 2014c. Effects of Gardenia jasminoides Ellis powder for external application in mice of sprain and contusion model. Mod. Eng. Solut. Ind., 4: 1193.

Shao, F., S.L. Li, R.H. Liu *et al*., 2011a. Analgesic and anti-inflammatory effects of different processed products of Aconiti late-ralis radix praeparata. Lishizhen Med. Mater. Med. Res., 22(10): 2329.

Shao, F., S.L. Li, R.H. Liu, *et al*., 2011b. Analgesic and anti-inflammatory effects of different processed products of aconiti late-ralis radix praeparata. China J. Chinese Med., 10(10): 1191-1193.

Shi, J.J., M.S. Mia and S. Bo, 2011. Pinellia topical anti-inflammatory and analgesic effects. Henan Tradit. Chinese Med., 9(31): 991-993.