



# Efficacy of Ginger Moxibustion in Management of Local Swelling and Pain at Injection Sites of COVID-19 Vaccines

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**Abstract:** Ginger moxibustion is characterized by performing easily, activating local blood circulation, warming meridian and unblocking collateral obviously. In order to observe the therapeutic effects of ginger moxibustion for local swelling and pain after COVID-19 vaccines, 36 cases were randomly divided into 2 groups, of whom 18 were treated with ginger moxibustion and 18 treated with hot compress. The results showed a cure rate of 100% with a total effective rate of 100% in the ginger moxibustion group, while 27.8% and 44.4% respectively in the hot compress group. The comparisons between the two groups in the cure rate and the total effective rate showed significant differences ( $P < 0.05$ ). The conclusion: ginger moxibustion has a good therapeutic effect for treating local swelling and pain, superior to that of the hot compress treatment.

**Keywords:** ginger moxibustion, COVID-19 vaccines, local swelling and pain

## 1. Introduction

Vaccination is the most economical and effective approach for preventing and controlling COVID-19. A significant proportion of the global population is susceptible to infections by the novel coronavirus, and most of them can be protected by acquiring immune protection after vaccination. Persistence of novel coronavirus transmission can be interrupted by gradual establishment of an immune barrier in the population through vaccination. As immune agents, vaccines are heterogeneous or macromolecular substances with immune protective effects that can produce other adverse reactions. Vaccine-associated adverse reactions are mainly divided into local and systemic reactions. Among them, local tenderness, redness and induration are the most common. In this study, ginger-partitioned moxibustion was applied to COVID-19 vaccine injection sites to treat local swelling and pain.

## 2. Clinical data

All of the 36 cases selected were outpatients, with local swelling and injection site pain as the main symptom after COVID-19 vaccination. They were randomly divided into the following two groups: the ginger moxibustion group consisted of 18 cases (including 8 males and 10 females), ranging in age from 32-71 years with a mean of 48.67 years, and with a mean duration of illness of 2 weeks. The hot compress group consisted of 18 cases (including 9 males and 9 females), ranging in age from 29-68 years with a mean of 48.56 years, and with a mean duration of illness of 2.5 weeks. Comparisons of the data in sex, age and duration of illness between the two groups showed no significant differences ( $P > 0.05$ ).

The Criteria for exclusion: (1) Local swelling and injection site pain that occurred without COVID-19 vaccination; (2) Aseptic abscess caused by vaccination with adsorbed COVID-19 vaccine; (3) Surrounding skin injury or rash or prickly heat.

## 3. Methods of Treatment

### 3.1 For the ginger moxibustion group:

Ginger was sliced into small pieces, wrapped with a gauze and squeezed to obtain the juice that was smeared on the injection part. Fresh ginger was sliced into thick sections with diameters of 2-3 cm and thickness of 0.2-0.3 cm. Several small holes were pierced in the middle of the slices using a needle. Routine disinfection of injection site was performed after which ginger slices were placed on the injection site, covered with the moxa cone and ignited. Then, the skin condition was observed until it turned slightly red and without blisters. Efforts were aimed at avoiding scalding. In cases of burning pain of sensation, ginger was lifted from the skin for a moment and placed back. In cases of unbearable pain, the ginger slice was moved or a paper was placed underneath it after which moxibustion was continued. Total treatment time was about 10-15 mins, twice daily for a total of 10 times to constitute a course, with a 2-day interval between courses.

### 3.2 For the hot compress group

After sterilization of local skin, hot water bottles are wrapped in hot towels and applied to the injection site. The total treatment time was about 10-15mins, three times daily.

## 4. Results of Treatment

Results of Treatment are shown in the following Table 1.

Table 1. The between-group comparison of the therapeutic effects Group

Group	n	Cured	Markedly effective	Ineffective	Total Effective Rate(%)
GingerMoxi.Group	18	18	0	0	100%
Hot compress Group	18	5	3	10	44.4%
P		<0.05			<0.05

From the above table, it can be seen that both the cure rate and the total effective rate in the ginger moxibustion group are higher than those of the hot compress group, indicating that ginger Moxibustion can give better effects for local swelling and pain.

## 5. Discussion

Local swelling and injection site pain occurs after vaccination. These outcomes are attributed to local stimulation and vaccine absorption into the muscles, which causes local qi and blood not free, qi and blood stagnation plug stagnation and heat, manifesting as local swelling and pain. Ginger-partitioned moxibustion was applied to COVID-19 vaccine injection sites to treat Local swelling and injection site pain that which are associated with improvement of the functions of the body's external defenses by warming Yang and strengthening, dispersing cold and dehumidifying. Moxibustion warms the meridian, unblocks collaterals and harmonizes qi and blood. Ginger juice, which is warm-natured, has detoxification, thermal and pharmacological effects and is therefore, appropriate for inhibiting scleroma. Ginger moxibustion is an external therapy involving synergistic effects of moxibustion and ginger. Moxibustion has been used to treat diseases for thousands of years, and its unique therapeutic effects have been proven in clinical practice. Ginger has medicinal and food values, as well as anti-inflammatory, analgesic, cholesterol reduction, free radical scavenging, antioxidant and anti-allergy properties among other effects. Artemisia argyi and ginger are green, safe, economical and convenient materials. Ginger moxibustion involves a combination of ginger and moxibustion. The efficacy of ginger is attributed to its pungent flavor, warm nature, and marked penetrative effects that allow it to better regulate qi, warm and invigorate moxibustion. Ginger moxibustion is a form of indirect moxibustion. Compared to direct moxibustion, ginger moxibustion avoids the burns, infections, scars as well as other problems caused by direct moxibustion and can also enhance the anti-inflammatory and analgesic effects of ginger. In addition, ginger moxibustion has low technical requirements, is effective and without adverse reactions. Therefore, it is easily accepted by patients.

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