

# A Randomized Controlled Study on the Clinical Effect of Mosquito Bite Treatment Instrument

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## Abstract

**Objective:** To explore the application value of mosquito bite therapeutic instrument in the treatment of mosquito bite patients. **Methods:** A total of 230 patients with mosquito bites who participated in the experiment from May 2021 to October 2021 were selected as the subjects of this investigation. According to the different treatment methods of the two groups, these 230 patients were divided into experimental group and placebo group, with 130 cases/group and 100 cases/group, respectively. During the treatment of patients, the bites of 130 patients in the experimental group were treated with mosquito bite therapeutic instrument, while the other 100 patients in the placebo group were treated with the same device without any output. The VAS score of swelling, pruritus, and pain were compared between the two groups on baseline, and 2, 5, 10 and 15 minutes after treatment, were registered. **Results:** By comparing the two groups of patients with a VAS score of swelling, pruritus, and pain, the results showed compared with the placebo group, the VAS scores of experimental group patients were significantly decreased, and the difference between the experimental group and the placebo group was statistically significant ( $P < 0.05$ ). **Conclusion:** During the treatment of mosquito bite patients, the use of mosquito bite therapeutic instrument can significantly reduce the pain of patients, quickly improve itching and swelling, can be widely used in the treatment of mosquito bite patients.

## Keywords

Mosquito bite treatment instrument, mosquito bite; Residual wound, pain, swelling, pruritus, Application effect

## Introduction

Insect bites and stings will usually cause a red, swollen lump to develop on the skin. This may be painful and in some cases can be very itchy. The symptoms will normally improve within a few hours or days, although sometimes they can last a little longer. Some people have a mild allergic reaction and a larger area of skin around the bite or sting becomes swollen, red and painful. This should pass within a week [1]. According to a study of data recorded by sentinel general practices in England and Wales, GP consultations about insect bites are 5.4/100 000 patients per week on average. This rises above 12 per 100 000 in August and September [2]. The exact incidence of insect bites and stings is not known as most are not reported [3, 4]. In this paper, 230 mosquito bite patients who participated in the riverside test from May 2021 to October 2021 were selected as the subjects of this investigation, and the effects

of mosquito bite therapeutic instruments in the treatment of patients' bite sites were studied and analyzed, and the application value of mosquito bite therapeutic instruments in the treatment of mosquito bite patients was explored. To provide reference for optimizing the treatment of mosquito bite patients.

## 1. Data and methods

### 1.1 General Information

A total of 230 patients with mosquito bites who participated in the experiment from December 2019 to December 2021 were selected as the subjects of this study. According to the different treatment methods of the two groups, these 230 patients were divided into experimental group and placebo group, with 130 cases/group and 100 cases/group, respectively. There were 76 males and 54 females in the experimental group, with an average age of  $(35.23\pm 2.67)$  years (range, 3-75 years). In the placebo group, there were 65 males and 35 females with an average age of  $(33.23\pm 2.24)$  years (range, 3-71 years). The survey and study were conducted with the consent of the subjects. There was no significant difference in the general data between the two groups ( $P>0.05$ ), which was comparable.

### 1.2 Methods

This study adopted a single-blind and randomized control design. After giving informed consent, subjects were allocated to experimental group and placebo group according to randomly generated treatment allocations within sealed opaque envelopes.

#### 1.2.1 Experimental group

Patients in the experimental group were treated with mosquito bite treatment instrument, and Bite Away® (RIEMSER Arzneimittel AG, Greifswald, Germany) was used. Bite Away® (RIEMSER Arzneimittel AG, Greifswald, Germany) is a CE-certified medical device of class 2A for noninvasive administration to the skin to reduce swelling, pruritus, and pain after insect bites/stings. Its microchip-controlled time-heat-constant guarantees a maximum temperature of  $51^{\circ}\text{C}$  on a  $38.5\text{-mm}^2$  gold-covered plate for either 3 or 6 seconds. Patients individually choose the 3-second button.

#### 1.2.2 Placebo group

Patients in the placebo group were treated with the same device as what the experimental group used but without any output.

### 1.3 Indicator Determination

In order to analyze the application value of mosquito bite therapeutic instrument in the treatment of mosquito bite patients, a survey table for the application effect of mosquito bite therapeutic instrument in the treatment of mosquito bite patients was designed, including VAS score of swelling, pruritus, and pain and other indicators on baseline, and 2, 5, 10 and 15 minutes after treatment for the two groups of patients.

### 1.4 Statistical Methods

The data of this study were included in the statistical software of SPSS20.0, and the count data were analyzed by  $\chi^2$  test, and  $P<0.05$  was considered as the difference and statistically significant.

## 2. Results

Experimental group and Placebo group.

### 2.1 Clinical data of the two groups

**Table 1. Clinical data of the two groups**

Groups	Average age(year)	Average duration (h)	VAS score
Experimental group (n=130)	$45.23\pm 2.67$	$0.35\pm 0.21$	$7.23\pm 1.13$
Placebo group (n=100)	$43.23\pm 2.24$	$0.38\pm 0.24$	$7.31\pm 1.43$

Experimental investigation showed that there was no significant difference in clinical data between the experimental group and the placebo group.

## 2.2 VAS score of the two groups

**Table 2. VAS swelling of the two groups**

Groups	baseline	2 min	5min	10min	15min
Experimental group (n=130)	4.56±1.13	2.53±1.21	2.41±0.98	1.68±0.84	1.54±0.87
Placebo group (n=100)	4.24±1.43	4.19±1.52	4.14±1.37	3.96±1.24	3.85±0.96
P	>0.05	<0.05	<0.05	<0.05	<0.05

**Table 3. VAS pain of the two groups**

Groups	baseline	2 min	5min	10min	15min
Experimental group (n=130)	5.76±1.83	2.84±1.42	2.61±1.14	1.84±0.92	1.67±0.94
Placebo group (n=100)	5.82±1.76	5.78±1.14	5.42±1.23	5.21±1.24	5.04±1.15
P	>0.05	<0.05	<0.05	<0.05	<0.05

**Table 4. VAS pruritus of the two groups**

Groups	baseline	2 min	5min	10min	15min
Experimental group (n=130)	4.84±1.45	2.13±1.14	2.04±1.06	1.94±1.01	1.88±0.92
Placebo group (n=100)	4.93±1.63	4.81±1.42	4.72±1.31	4.62±1.17	4.54±1.05
P	>0.05	<0.05	<0.05	<0.05	<0.05

The experimental results showed that there was no difference in VAS score of swelling, pruritus, and pain between the experimental group and the Placebo group at baseline, but the scores of the two groups were decreased after treatment to 2, 5, 10, 15 minutes, and the VAS value of the experimental group decreased more obviously. In this experiment, VAS evaluation data before and after treatment showed that the VAS swelling score of the experimental group at baseline was (4.56±1.13); And the VAS swelling score after treatment to 15 minutes was (1.54±0.87). The VAS swelling score of the placebo group was (4.24±1.43) at baseline and (3.85±0.96) after treatment to 15 minutes. The VAS pain score of the experimental group at baseline was (5.76±1.83) and after treatment to 15 minutes was (1.67±0.94); The VAS pain score of the placebo group was (5.82±1.76) at baseline and (5.04±1.15) after treatment to 15 minutes. The VAS pruritus score of the experimental group at baseline was (4.84±1.45) and after treatment to 15 minutes was (1.88±0.92); The VAS pruritus score of the placebo group was (4.93±1.63) at baseline and (4.54±1.05) after treatment to 15 minutes. The pain, swelling and pruritus of the experimental group was significantly improved after treatment, and the differences between the two groups were statistically significant ( $P<0.05$ ). None of the patients had any adverse effects in each group.

## 3. Discussion

Mosquito bites are a very common and unexpected event of daily life, especially in the summer and fall when the weather is very warm and humid. After mosquito bites of the patient's skin can appear round or oval in shape, the size of soybean edematous erythema, accompanied by itching and redness at the same time, patients will involuntarily to scratching, will lead to bite skin damage, infection, and so on and so forth, itchy skin condition is more serious in the night, the patient will appear the mood be agitated, urgent. Most people have been bitten by mosquitoes to get the situation, especially in the wild, riverside activities of people, more likely to be bitten, people usually use ointment, balm and other antipruritic smear, but the effect is ineffective, after a while will still appear itching, and the redness and swelling is serious. Therefore, this study explored the efficacy of mosquito bite in-

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strument in improving patients' pain, itching, redness and swelling by conducting mosquito bite anti-itch test in the river, so as to provide reference for people to treat mosquito bites.

People often use antipruritic ointment or drugs orally after being bitten by mosquitoes to improve the disease, but the effect is often slow and limited, and patients are still prone to itch at the bite site in 1-2 days. On the other hand, introduce toxins into the skin after a mosquito bite. These toxins can cause pain, irritation and inflammation. The main component of toxin is protein molecules, which will be destroyed when the temperature exceeds 50°C. The metal heat sheet used by a German mosquito to bite a young nurse uses this principle to heat the local part of the bite to more than 50 °C to destroy protein molecules.

The application of mosquito bite therapeutic instrument in the treatment of mosquito bite patients can effectively improve the pain of mosquito bite patients, relieve itching, and make patients' psychological state more stable. At the same time, the mosquito bite treatment instrument also has a good bacterial removal effect, reduce the infection of bacteria to the mosquito bite of patients. It can be seen that in the treatment of mosquito bite patients, the application of mosquito bite therapeutic instrument has a better effect, which can be popularized in clinical application.

#### **4. Conclusion**

In conclusion, the mosquito bites in the process of treatment, in order to improve the treatment effect, can give patients with mosquito bites instrument for rapid itching, through the experiment research proves that using mosquito bites, an instrument, to be able to treat patients with mosquito bites play better analgesia, relieving itching, swelling.

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