

Sugar patch for local reactions to bee stings.

Clinical test of patch containing sucrose.

Abstract

Insect venoms contain various enzymes, and low molecular weight substances with toxic effects. Composition and amount differ between species, but humans will in all cases react with pain and swelling when stung or bitten. The primary treatment is to remove the sting as quickly as possible, since this will reduce the amount of venom given. Secondly, various kinds of local treatment has been recommended, ranging from suction (Giftsuger®) to application of ice and various chemicals in order to reduce the pain and swelling. None of these have been scientifically tested. One of the suggested principles is osmosis by humidified sugar which has been known as a house remedy to treat stings from wasps, where both swelling and pain is reduced. The aim of the present study was to investigate the effect of sugar-saturated bandages on pain and swelling after stings from bees.

Material and methods

Healthy adults, aged 19 – 58 years, females and males, with no allergy to bee stings accepted to participate. All have had local reactions to stings from bees or unidentified insects of at least 5 cm and none were taking antihistamines, corticosteroids or other medications that could affect the results. The study was accepted by the regional Ethics Committee and National Board of Health and monitored according to GCP. Before inclusion a negative skin prick test (missing data from 1) and no specific IgE to bee venom was ensured.

Participants were stung simultaneously by honey bees on the dorsal side of each lower arm. Insects were left in place for 30 sec. Then insects and stingers were removed, a drop of water was applied to the textile side of each bandage before these were applied to the stinging sites. The active bandage (18 x 30 mm) contained 220 mg of sugar (sucrose); the placebo bandage had no additive. The test was performed double blinded. Bandages were left for one hour and slight pressure applied to ensure contact between sugar and skin.

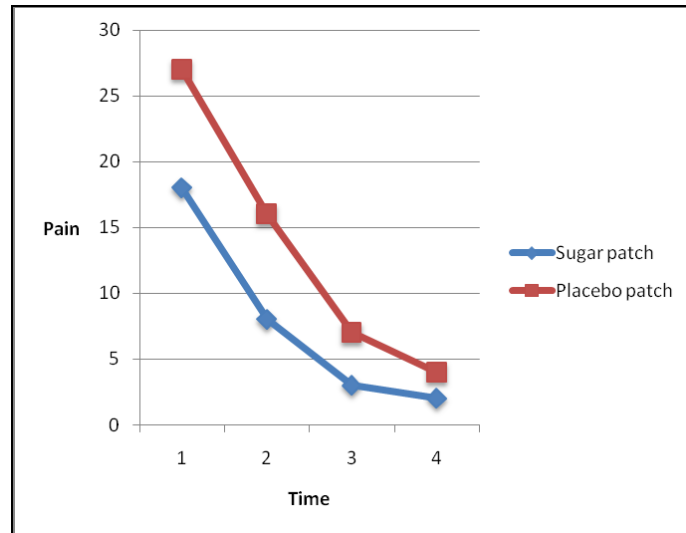
Pain was registered on a 100 mm visual analogue scale (VAS) was measured every 15 min and median diameter of swelling every 30 min for the first hour and areas under the curves calculated. Itching and swelling after 24 hours were registered by the participant at home (missing data from 2). Wilcoxon signed rank test was applied on differences in each participant and a P value <0.05 was regarded significant.

Results

It was shown in 9 cases that the patch could lower both pain and swelling significantly during the whole test period (average 50%). Based on the high difference between data points on the VAS-scale of the limited number of participants, and the parameters described in "Discussion", it is difficult to address a conclusive answer. No local reaction (redness or skin irritation) was observed during the use of patch.

Time:	Sugar patch (av. 9 persons)	Placebo (av. 9 persons)
Pain 15 min after start	18	27
Pain 30 min	8	16
Pain 45 min	3	7
Pain 60 min	2	4
Pain 24 h	10	15
Swelling 24 h	24	42

Evaluation of clinical test K-516, Copenhagen, 2009-2010.



Discussion

Application of humidified sugar on the skin after stings from wasps has been known for decades as a home remedy in many countries. The effect is thought to be due to osmosis acting through the puncture after the stinger, hereby extracting the toxic components in the venom. Instead of carrying sugar along in case of sting, a patch with sugar would be much more convenient.

There are many examples of the beneficial effect of sugar as treatment after stings from wasps. This justifies a clinical investigation as K-516. However, to use wasps as experimental animal is a difficult task. You never know how much poison they inject. This may vary between 2-10 μg . It was suggested to use bees instead. By using bees, which leaves the stinger in the skin, it is easy to find an average time to leave the stinger. Hereby no change in the injected amount of poison would appear.

On the other hand the amount of poison from bees is between 50-100 μg . Leaving the stinger for 30 sec. the amount of poison is much higher than under "normal conditions" (accidentally get stung by a bee or a wasp). The amount of poison that a bee injects may vary depending of the lifecycle of the bee. The bees were harvested from different beehives from March to November. In addition, the poison from bees is acidic (pH 4.5-5.5) and the poison from wasps is basic (pH >7.5).

Taking these facts into account it is questionable if the results from this trial can be used or not. Certainly they do not reflect real life under "normal conditions".

In order to carefully investigate the concept, this test has to be reproduced taking into account all of the uncertainties. Therefore, another clinical test using wasps will be scheduled in near future.

Using the Bee-Patch patch which contains 250 mg of sugar, or 70 % more sugar per cm^2 , it is believed that the test results will be more convincing.

Evaluated and signed by

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