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File: ■ Olive (*Olea europaea*, Oleaceae) Oil
■ Alkanet (*Alkanna tinctoria*, Boraginaceae)
■ Beeswax (*Cera Alba*)
■ Burn Injuries

HC 111752-594

Date: June 15, 2018

RE: Efficacy of a Mixture of Beeswax, Olive Oil, and Alkanet for Burn Injuries

Gümüş K, Özlü ZK. The effect of a beeswax, olive oil and *Alkanna tinctoria* (L.) Tausch mixture on burn injuries: An experimental study with a control group. *Complement Ther Med*. 2017;34:66-73.

Severe burns have high rates of morbidity and mortality and require long-term hospitalization. Such burns cause intense pain and can lead to significant changes in physical appearance. In folk medicine, beeswax (*cera alba*), olive (*Olea europaea*, Oleaceae) fruit oil, and alkanet (*Alkanna tinctoria*, Boraginaceae) root are used to treat burns. Beeswax and olive oil have reported antioxidant and antibacterial activity, while alkanet has reported antimicrobial activity. According to the authors, no studies with scientific rigor have been conducted that evaluate these treatments. The purpose of this controlled study was to evaluate the effect of a mixture of beeswax, olive oil, and alkanet on burn healing, pain during dressing changes, and duration of hospital stay. The study was not conducted as a randomized, controlled study "because the hospital stays of the patients were not the same, patient rooms in the clinic could not be separated and the wound dressing room could be seen by all patients."

Patients (n = 73; mean age, 6.68 years in the experimental group and 5.52 years in the control group) with second-degree burns on the extremities participated in the study conducted between May 2014 and August 2015 at the burn unit of Atatürk University Hospital; Erzurum, Turkey. Patients were sequentially enrolled upon admission to the burn unit. Included patients were > 3 years old and < 65 years old, had noninfected burns, had no chronic diseases, had burns other than chemical and electrical burns with certain borders, and had not undergone a surgical procedure that could affect healing.

The experimental group was treated with a sterilized mixture of 1000 mL medical olive oil, 30 g beeswax, and 50 g alkanet, which was mixed especially for the study. The quantity of mixture used was in proportion to the size of the injury. The control group was treated with a standard therapy of nitrofurazone, rifamycin, and irrigation.

After cleaning the surface of all injuries with 0.09 NaCl and 0.010 Savlon®, the injuries were photographed before the wounds were dressed. In the burn unit, the dressing was changed daily (as done in folk medicine) in the experimental group and every 2 days in the control group (in accordance with hospital policy and routine clinical practice). A wound culture was taken the third day after the burn occurred. When the size of the burn was less than 1 mm, treatment was terminated and the patient was discharged. A visual analogue scale and facial expression scale were used to evaluate intensity of pain. Visualization and evaluation are standard methods of evaluation of burn injuries; accordingly, the injuries were photographed for evaluation. The starting time of epithelialization, hospitalization duration, and mean pain scores during dressing changes were recorded.

Baseline characteristics were similar between groups ($P > 0.05$ for all). Most of the injuries were caused by boiling liquids, and the patients were admitted to the hospital within the first 24 h after injury. No infections occurred in the experimental group, while 6.1% of the control group got an infection. Epithelialization started significantly earlier in the experimental group than in the control group (3.0 vs. 6.9 days, respectively; $P < 0.001$). Mean pain scores were significantly lower in the experimental group than in the control group (8.12 vs. 9.39, respectively; $P < 0.001$). Mean hospitalization duration was significantly shorter in the experimental group than in the control group (8.22 vs. 14.42 days, respectively; $P < 0.001$).

The authors conclude that epithelialization in the experimental group started very quickly, which corresponds with the shorter hospitalization duration. This finding supports previous in vivo studies. A limitation of the study was that a decrease in narcotic use was not evaluated. So, it is unknown whether the improvement in pain would be enough to decrease the use of pharmaceutical painkillers. Other limitations were that the study was not blinded, and the control and experimental groups had different times of dressing changes (i.e., daily vs. every 2 days). Therefore, it is unknown whether the effect of daily dressing improved wound healing independent of the therapy applied. Nonetheless, the authors conclude that the experimental treatment "accelerated the process of epithelialization, reduced hospitalization durations, reduced the levels of pain experienced by the patients during dressing and completely prevented wound site infections in the experimental group." These results suggest that this mixture may be an effective burn treatment. However, future studies should include a larger population, an older population, other burn types, and have both groups' wounds handled similarly.

The authors declare that they have legally equal ownership rights (right ownership of 50%) of the product (patent pending).

—Heather S. Oliff, PhD