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Research Paper

Objective and subjective scar aesthetics with topical Manuka honey post-thyroidectomy: A randomized control study

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Abstract *Objective: Leptospermum* Honey (Manuka honey) has proven to be effective in improving acute and chronic wound healing presumably due to its antibacterial and anti-inflammatory properties. The aim is to determine if Manuka honey decreases scar formation and results in a cosmetically appealing scar.
Methods: A prospective single-blinded randomized control trial was performed. All patients received an 8 cm incision. Patients randomized to honey treatment were instructed to apply Manuka honey paste topically to the incision site once per day post surgery for 4 weeks. The patients' scar was then analyzed objectively by a blinded observer and subjectively at 4 and 8 weeks postoperatively. The primary outcome measure used was the Patient and Observer Scar Assessment Scale (POSAS).
Results: A total of 21 patients completed the entire scar analysis (honey treatment = 9, standard treatment = 12). There was no statistically significant difference between patient scar assessment scale and observer scar assessment scale at 4 and 8 weeks postoperatively.

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Conclusion: Despite *Leptospermum* Honey's reported anti-inflammatory and antibacterial properties, this study did not show a difference in scar appearance when applied.

Introduction

Thyroidectomy is a very common surgical procedure. The current standard of care is to perform thyroidectomy by an open technique.[1,2] This is generally well tolerated and has proven an effective and efficient way of removing thyroid tissue. Even though well tolerated, open thyroidectomy leaves the patient with an approximately eight centimeter scar — a non-cosmetic result. This fact has generated investigation into a number of cosmetically favorable approaches in performing thyroid surgery. Endoscopically assisted open thyroid surgery with reduced incision size and endoscopic thyroid surgery through the axilla or anterior chest wall are the most common surgical innovations. Although promising, thyroid surgery utilizing endoscopy has so far had limited application, and the majority of thyroidectomy must still be performed openly.[1,2] Therefore, there is need for a method to improve healing and reduce scar formation.[3] Much research has gone into topical agents applied to incision sites. To date only silicone gel sheeting has consistently been shown to prevent formation and diminish appearance of hypertrophic scars.[4] In this study, we were interested in evaluating the potential benefits topical Manuka honey has on wound healing and reduction of scar formation.

Manuka honey is a monofloral honey that comes from *Leptospermum* tree pollen in New Zealand and Australia.[5] Generic honey has been used in medicine for a number of years. There is good evidence for its use topically as a barrier and an antiseptic.[6,7] Manuka honey is known to have added antibacterial benefits, which are attributed to an additional unique non-peroxidase activity described as Unique Manuka Factor (UMF).[5] In addition, evidence from animal trials suggests Manuka honey improves healing of ulcers, lacerations and burns. Currently, Manuka honey is most commonly used as a topical application to treat partial to full thickness burns as well as venous leg ulcers.[5,7] Manuka honey has been used elsewhere in Otolaryngology, including in the management of chronic pilonidal sinus wounds and nasal mucosal healing following function endoscopic sinus surgery.[5,8]

Materials and methods

A prospective study was performed at Vancouver General Hospital, a tertiary referral center for thyroid cancer. This study obtained University of British Columbia Clinical Research Ethics Board approval. Patients undergoing a hemi- or total thyroidectomy were included in this study. All patients had to accept an incision site of 8 cm. Any incision made to be longer than 8 cm were removed from the study. All patients were 19 years of age or older. Patients were excluded if they were allergic to pollen, honey or bees.

Consecutive patients fitting the inclusion and exclusion criteria were approached to participate in the study by the research coordinator. If patients were agreeable to the study, the research coordinator used a closed envelope system to randomize each patient to either the treatment or control arm. The primary surgeon who performed all the surgeries was not aware of the study arm throughout the study. The treatment arm consisted of patients using a honey gel paste (MediHoney®) containing 95% active *Leptospermum* honey. The paste was applied by hand to the incision site once per day during the 4 weeks after surgery and left in place to dry. Patients were instructed to clean the incision site daily with mild soap and water. If patients anticipated extended sun exposure, they were to place sunscreen on the incision site. In similar fashion, the control arm cleaned the incision site daily with mild soap and water and applied sunscreen on the incision site if they anticipated sun exposure; however, they did not use any form a scar reducing agent or antibacterial cream.

Patients underwent formal objective and subjective analysis at 4 and 8 weeks postoperatively. At the scar analysis visit, patient's sex, age, and Fitzpatrick skin classification was recorded. The scar was then assessed subjectively and then objectively using a validated scar assessment scale used known as the Patient and Observer Scar Assessment Scale (POSAS) (Fig. 1).[9] Objective scoring was performed by the senior resident, who was also unaware of the treatment arm of each patient.

A priori, it was determined that a minimum of nine patients were required in each study arm to appropriately power the study based on a study by O'Connel et al.[10] They based their calculations after determining the minimal important clinical difference required in using the POSAS based on an α of 0.05 and a power of 0.80. Statistical analysis was performed using GraphPad 5.0. Continuous data was assessed using the Mann—Whitney test and the Fischer exact for categorical data.

Results

A total of 21 patients completed the entire scar analysis study. Thirty-seven patients consented to partake in the study, 18 of whom never completed the long-term scar analysis assessment. The cohort that completed the study was analyzed, which consisted of 12 control arm patients and 9 treatment arm patients. There were 4 males in the control arm and 2 males in the treatment arm. The average age was 49 years old and 53 years old for the control and treatment arm, respectively. With respect to the Fitzpatrick skin classification, the control group had 1 individual with type 1 skin, 3 with type 2 skin, 4 with type 3 skin and 4 with type 4 skin. The treatment arm had 2 with type 2 skin, 3 with type 3 skin, 2 with type 4 skin and 2 with type 5 skin.