
Fahad Al-Saif, E. Al-Mekhadab, H. Al-Saif

Department of Dermatology, College of Medicine, King Saud University, Riyadh, Saudi Arabia

Address for correspondence:
Dr. Fahad Al-Saif, Department of Dermatology, College of Medicine, King Saud University, P.O. Box 7805, Riyadh 11472, Saudi Arabia. Phone: +966-11-4691426. Fax: +966-11-4691432. E-mail: fsaif1000@hotmail.com

Objective: Becker’s nevus (BN) is a benign cutaneous hamartoma. Although different types of lasers have been used to treat the pigmentary part of BN, to date, no definite treatment modality has been determined. The objective of this study is to evaluate the efficacy and safety of erbium: yttrium aluminum garnet (Er: YAG) laser treatment among Saudi patients with BN.

Patients and Methods: A series of 10 patients (skin phototypes III-V) with BN underwent treatment with an Er: YAG laser. Biopsies were taken from all patients to confirm the diagnosis. Treatment consisted of using a 2940 nm Er: YAG laser (fluence 700 mj/cm², short pulse, 3 mm spot size). Each patient underwent one session with three to five passes (the endpoint of passes was pinpoint bleeding). Clinical outcome was assessed using digital photographic method, before each treatment session and after the final visit. Clinical assessment scores were determined at each follow-up visit.

Results: Seven patients completed the study. All patients noticed a significant reduction in pigmentation. Five of the patients had good improvement, and the remaining two had moderate improvement. The mean reepithelialization time was 7 days, and post-treatment erythema was seen in all patients (mean follow-up of 6 weeks). Post-inflammatory hypopigmentation was observed in all patients. No untoward sequelae were observed during the study or follow-up period.

Conclusion: Er: YAG laser therapy can be an efficient modality for reducing the pigmentary part of BN. No scar formation, significant dyspigmentation, or recurrences were observed after 1 year.

Keywords: Becker nevus, erbium: yttrium aluminum garnet laser, Saudi
to treat BN hyperpigmentation, with variable success. BN is a major cosmetic issue in Saudi patients, especially females, with no Saudi BN studies having been reported to date. Here, we aimed to evaluate the effect of Er: YAG laser treatment of BN in Saudi patients.

**Patients and Methods**

The study was carried out in the dermatology clinic of King Saud University Medical City in Riyadh, Saudi Arabia, between October 2012 and September 2014. The study protocol was evaluated and approved by the Institutional Review Boards (IRBs) of the College of Medicine, King Saud University (Ref.No.16/0068/IRB). Before participation in the study, each participant provided written informed consent. Biopsies were taken from all patients to confirm the diagnosis. Inclusion criteria included generally good healthy controls, being at least 18 years of age and having documented histopathology of BN. Ten patients (5 females, 5 males, mean age 23.1, range 19-27) were treated with a 2940 nm Er:YAG laser (fluence 700 mj/cm², short pulse, 3 mm spot size), with 3 to 5 passes (the end point of passes was pinpoint bleeding).

For participants who met the inclusion criteria, at the baseline visit, spot tests were performed, and if the patient accepted the results, split-lesion treatment was performed, except for one female patient, who insisted on having the whole lesion treated because of social issues. All participants were asked to return 1 week after the initial treatment for baseline assessment and at 1-, 3-, 6-, and 12-month post-laser therapy for the clinical evaluation. Photographs were taken from all patients at the spot test, before each treatment and at the end of the study period. Improvement of BN appearance was assessed by non-blinded reviewers and conducted by the treating physicians, using a percentage category scale (no improvement: 0%, slight improvement: 1-25%, moderate improvement: 26-50%, good improvement: 51-75%, excellent improvement: 76-100%).

Collected data were analyzed using Predictive Analytics Software Version 18 (SPSS Inc., IBM and Chicago, Illinois, USA). Results are expressed as mean, standard deviation, and percentages.

**Results**

Three female patients dropped from the study due to unsatisfied spot test result. A total of 7 patients (5 males and 2 females) aged between 19 and 27 years old with Fitzpatrick skin Types III-V completed the study. The mean duration of illness for all patients was 8.9 ± 3.9 years (range: 4-15 years). All the lesions were over the upper extremities. Hypertrichosis was present in 4 patients. Figure 1 is a representative example of the spot test, which was performed in all patients. Exudation and superficial crusting were initially observed, which then peeled off at 2 weeks after treatment. During the post-operative assessment, all patients reported mild pain in the treated areas within first 24 h, which gradually decreased during the next 72 h to 1 week. All 7 patients noticed a significant reduction in the pigmentation compared to the untreated section. Five patients (71.4%) had good improvement, and 2 (28.6%) had moderate improvement. We observed no change in the hair density of those patients with hypertrichosis. Figures 2-5 show the end results of treatment. The mean time for reepithelialization was 7 days. Post-treatment erythema was seen in all patients. The mean average duration of post-treatment erythema was 6 weeks, while post-inflammatory hypopigmentation was observed in all patients and resolution of hypopigmentation...
BN lesions and are clinically effective,9 however, this approach is problematic because of significant side effects. At least two studies have applied a fractional ablative resurfacing laser to BN, with moderate effectiveness in some patients.10,18 However, post-inflammatory hyperpigmentation and relatively negative patient-reported outcomes preclude ablative fractional laser therapy from being a standard therapy.10 Studies using intense pulsed light and Q-switched ruby laser reported disappointing results, while a frequency-doubled Q-switched Nd: YAG approach was shown to be more effective than intense pulsed light in the treatment of BN.11 A picosecond 755 nm alexandrite laser was recently applied to BN with variable results.13 All of the patients enrolled in this study had a typical distribution (e.g., on the shoulder, scapula, arms, and upper back). Four patients had hypertrichosis. Treatment side effects were limited to transient erythema, crust formation, and hypopigmentation, with most of the hypopigmentation improving spontaneously to some extent within 6 months. Healing was uneventful in all of our patients, and there were neither scars nor hyperpigmentation after 12 months of follow-up, despite most of the Saudi being dark-skinned. No significant hyperpigmentation or repigmentation in our patients in contrast with the findings of other reports.10,18 We observed no change in the hair density in patients with hypertrichosis and these patients were advised to use laser hair removal.

There were no recurrences of the disease at 1-year post-treatment follow-up, suggesting that Er: YAG laser treatment was effective. All of the patients involved in this study were satisfied with their treatment outcome, with a satisfaction rate similar to the one reported by Trelles et al.9 To enhance treatment efficacy and to minimize the side effects, further studies on larger group of patients should be conducted to establish the optimal parameters of Er: YAG laser treatment.

References

8. Raulin C, Schönermark MP, Greve B, Werner S. Q-switched ruby