

Original Research Article

Topical olive oil and narrow band ultraviolet-B trial for segmental vitiligo among adult Sudanese patients in Khartoum state, Sudan 2018

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ABSTRACT

Background: Adult segmental vitiligo treated by narrow band ultraviolet B (NB-UVB) showed delayed repigmentation. This study is being undertaken to determine the efficacy of topical olive oil addition before (NB-UVB) sessions for vitiligo patients (pts).

Methods: Randomized controlled trial (RCT) enrolled ten volunteers suffering segmental vitiligo on both upper limbs, all patients left limb was tested by topical olive oil before each NB-UVB session and twice daily in session free days for a total of 20 sessions (46 days), the right upper limb was the control (only NB-UVB), each site response was assessed based on time of appearance of erythema and repigmentation. Statistical analysis was done by the Chi-square test.

Results: All patients were ten, seven were female (70%), three males (30%) of middle age group, university graduates live in Khartoum state. Their left upper limbs showed erythema in <3 sessions in five pts (50%) and three-five sessions in (50%), repigmentation started in <3 sessions in one patient (10%) and three-four sessions in five pt. (50%) and >5 sessions for four pts (40%), pattern of repigmentation was marginal in eight pts (80%), mixed in two pts (20%). Their right upper limbs showed erythema in three-four sessions in two pts (20%) and eight pts (80%) needed five sessions, repigmentation started after five sessions in all patients (100%), pattern of repigmentation was follicular in one pts (10%), marginal in five pts (50%), mixed in four pts (40%).

Conclusions: Addition of topical olive oil to NB-UVB for segmental vitiligo patients showed earlier occurrence of repigmentation and better pigmentation pattern.

Keywords: Vitiligo therapy, Olive oil, Narrowband ultraviolet B

INTRODUCTION

Worldwide prevalence of vitiligo is 0.2% being commoner among African female, and in recent twenty years vitiligo has dramatically declined because of advanced therapy being introduced and the growing community awareness about the nature of the disease.¹ Although a lot of innovative therapies being introduced, vitiligo therapy remained challenging for long time

because of the disease nature which shows slow repigmentation process, the last most beneficial therapy with least side effects is narrow band ultraviolet B (NB-UVB) which is proven to be the most tolerable and safe modality.² Many trials used NB-UVB to enhance repigmentation in vitiligo skin patches were tried by addition of chemicals over NB-UVB which is named photo-chemotherapy by applying topical and systemic steroids, topical calcineurin inhibitors, topical vitamin D

analogs in monotherapy or association with phototherapy and showed better repigmentation outcome, but the current use of only NB-UVB as monotherapy for vitiligo remained the best with fewer side effects such as acute dermatitis and photo-allergic dermatitis which occurred with photo-chemotherapy trials.³

In vivo trials of topical olive oil before NB-UVB sessions for vitiligo therapy was not tried before, but animal trials showed reduced tumorigenicity of NB-UVB induced cancers and was proven to be antioxidant and had DNA repair capability.⁴

In vivo, daily topical application of super virgin olive oil after sunbathing may delay and reduce UV-induced skin cancer development in human skin, possibly by decreasing ROS-induced 8-OHdG which is responsible for gene mutation.⁵ Also it has beneficial role in reducing risk of post phototherapy dermatitis.⁶ But it can exacerbate existing dermatitis by interrupting the natural barrier function of skin.⁷

Topical olive oil could acts as sunscreen, but contains 2-ethylhexyl-4-methoxycinnamate and 4-t-butyl-4'-methoxy-dibenzoyl methane which is UVB absorber, maintaining proper penetration of ultraviolet lights to deep epidermal and dermal compartments of the skin.⁸ Olive oil doesn't interfere with ultraviolet light penetration and can be applied before NB-UVB sessions safely also topical olive oil nourishes the skin without harmful toxic that's why olive oil being added to various cosmetic formulas.^{5,8}

Objectives

The main aim of this pilot study was to figure out the number of sessions needed (topical olive oil and NB-UVB) to enhance erythema and stimulate repigmentation and the pattern of repigmentation process on vitiligo skin patches on the left upper limbs compared the right upper limbs subjected to only NB-UVB.

METHODS

A randomized control trial (RCT) was conducted in Sudan, Khartoum state from December 2018 to April 2019 for adults with segmental vitiligo patients on both upper limbs, patients were not on any drug therapy or topical formula enhancing repigmentation. Ten volunteers were involved in this study and subjected to day after day NB-UVB sessions on both right and left upper limb for a total of twenty sessions, in the left upper limbs (test) topical olive oil was applied twice daily and before each day NB-UVB sessions, the right upper limb is subjected to only NB-UVB (control). Patients had understood the ethical clearance and discussed carefully, written consent was taken. All patients were assessed interview sheet covering their gender, age, residence, educational level, type of therapy received and assessed clinically before and after each session on each upper

limb (left is test-right is control) and assessment sheet filled covering the number of the session and occurrence of erythema, start of repigmentation, pattern of repigmentation and a photo was taken. Collected data were analyzed using the SPSS version “20”. Correlations between the variables were estimated by the correlations coefficient of determination (p-value). P-value <0.05 was considered statistically significant ≥ 0.05 is statistically insignificant.

RESULTS

All ten segmental vitiligo patients (100%) were living in Khartoum state, (90%) were university graduates and had vitiligo on both upper limbs, female were 7 (70%) while male were 3 (30%). The left side upper limbs tested with 100% pure topical olive oil applied twice daily and before each NB-UVB session showed occurrence of erythema in less than three sessions for 5 patients (50%), while the other 5 patients (50%) had erythema in three to five sessions and started repigmentation in less than three sessions for one patient (10%) and 5 patients (50%) in three to four sessions and 40% patients in more than five sessions and the resulting pattern of repigmentation was marginal in 8 patients (80%) and mixed in 2 patients (20%). On the right side tested only by NB-UVB sessions showed erythema in three to four sessions in 2 patients (20%) and the majority 8 patients (80%) in more than five sessions while the repigmentation started in all patients (100%) in more than five sessions and the resulting pattern of repigmentation was follicular in 10 patients (10%) and marginal type in 5 patients (50%) and the remaining 4 pt. (40%) were mixed type. The response rate of vitiligo repigmentation and occurrence of erythema when topical olive oil was applied on the left hands was significant (p=0.048), in compare to only NB-UVB applied on right hands (p=1).

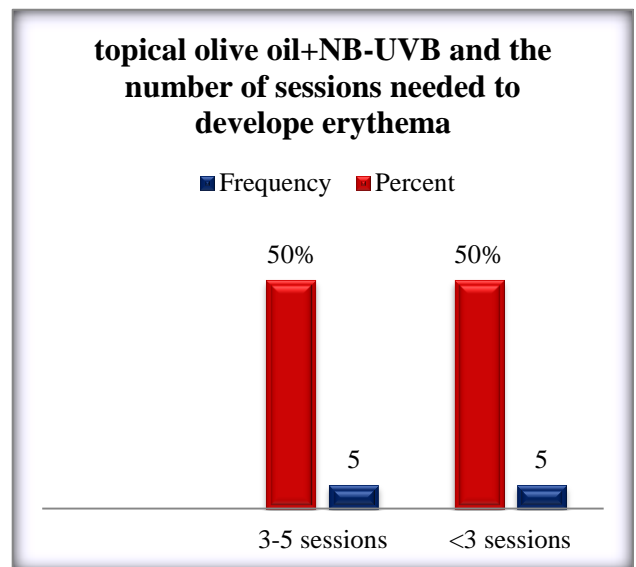


Figure 1: Distribution of the study participants (test) according to the occurrence of erythema (n=10).

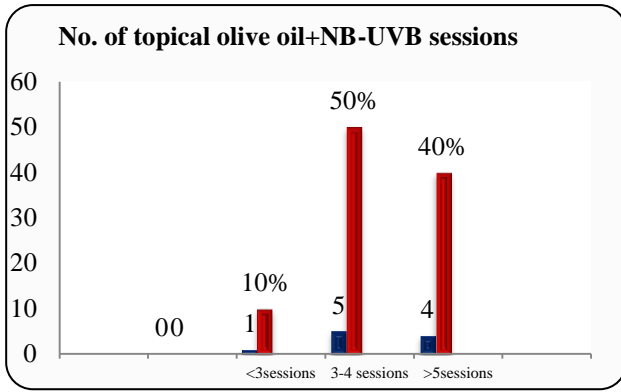


Figure 2: Distribution of the study participants (test) according to the start of pigmentation (n=10).

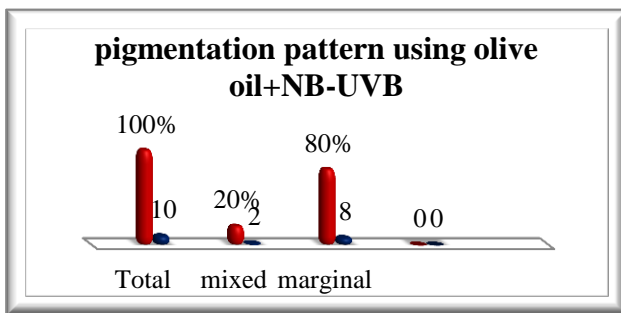


Figure 3: Distribution of the study participants (test) according to the pattern of pigmentation (n=10).



Figure 4: Left-hand tested area (olive oil and narrow band ultraviolet B), right hand (only narrow band ultraviolet B).



Figure 5: Left-hand tested area (olive oil and narrow band ultraviolet B), right hand (only narrow band ultraviolet B).

DISCUSSION

Segmental vitiligo (partial vitiligo) is commoner among female age group and the common treatment regime is ultraviolet B light therapy (narrow band) which is the best modality for enhancement of repigmentation for vitiligo skin patches in a minimum duration of nine month as monotherapy.⁹ NB-UVB monotherapy found to be better for generalized vitiligo type, but has few side effects like xerosis and burn, although previous studies recommended to avoid white petroleum compounds application before phototherapy as it may affect light penetration into skin, olive oil doesn't affect phototherapy penetrance.^{10,11}

At the present study, two thirds of participants were females, with a male to female ratio of 1: 2.3 with a mean age of 30.15. All patients were assessed clinically by means of visual method and photos taken before and after each session in both tested and control areas, it simplified classification of the type and pattern of pigmentation.¹² Clinical assessment of the effects on left upper limb (test) and the right side upper limb (control) areas on the same patient was done and written down in assessment sheet. A significant difference between both upper limbs was observed regarding the earlier occurrence of erythema and repigmentation and better pigmentation pattern on the left side (test) in all ten patients.

In patients treated by topical application of olive oil on the left upper limb before NB-UVB sessions and twice daily in session free days for 20 sessions of NB-UVB in 46 days >50% had erythema in less than three sessions for 50% pts correlating with previous in vivo test of white petroleum products containing olive oil when applied before NB-UVB sessions it enhanced light penetration.¹³ Meanwhile the right side tested by only NB-UVB erythema occurred in 80% after five sessions which indicated more absorption of UVB when topical olive oil is applied before sessions.¹⁴ And the correlate with the fact that erythemogenic effect of UVB only is seen after 19 session.¹⁵ Future adjustment of minimum erythema dose is recommended before UVB. Repigmentation on the tested area started earlier in one patient 10% in less than three sessions compared to control areas which started repigmentation almost after five sessions in 100%, and in previous studies where by the use of NB-UVB showed delayed repigmentation in more than twenty sessions at least.¹⁶ The main role of olive oil in repigmentation process is due to facilitation of more penetration of NB-UVB to skin as well as nutritive effect on melanocytes.^{5,8} Best repigmentation pattern was achieved in tested area which was marginal pigmentation pattern in eight pts 80% the most stable type compared to control which was 10% follicular which is the worst with higher depigmentation rate and only 50% were marginal type and the use of only NB-UVB necessitate frequent sessions (dependency).^{17,19}

CONCLUSION

To conclude, the addition of topical olive oil before NB-UVB and on daily basis in session free days for segmental vitiligo patients is preferred over NB-UVB only therapy for enhancing erythemogenic effect of NB-UVB and enhancement of repigmentation and result in best repigmentation pattern which is the marginal type and minimizes post phototherapy itch and dermatitis.

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Conflict of interest: None declared

Ethical approval: The study was approved by the institutional ethics committee

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