

# Treatment of Patients with Vitiligo by Intradermal Pricking of Vitiliginous Skin Using Sharp and Blunt Needle

Khalifa E. Sharquie<sup>1,2\*</sup>, Adil A. Noaimi<sup>1,2</sup>, Zahraa N. Al-Khafaji<sup>3</sup>

<sup>1</sup>Department of Dermatology, College of Medicine, University of Baghdad, Baghdad, Iraq

<sup>2</sup>Iraqi and Arab Board for Dermatology & Venereology, Baghdad Teaching Hospital, Baghdad, Iraq

<sup>3</sup>Department of Dermatology, Baghdad Teaching Hospital, Baghdad, Iraq

Email: \*ksharquie@ymail.com, adilnoaimi@yahoo.com, alkhafajizahraa@yahoo.com

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## Abstract

**Background:** Vitiligo is a well known autoimmune disease, both cell mediated and humeral reaction are implicated in its etiopathogenesis. Pricking of marginal pigmented of vitiligo skin to stimulate normal melanocytes to migrate into vitiliginous area and induce new melanogenesis and this is well known mechanism to induce repigmentation and supported by publications. **Objective:** To use needling technique by using blunt and sharp needle by doing pricking completely white vitiligo skin in order to stimulate residual melanocytes of basal layer and or the melanocytes of outer root sheath of hair follicles to proliferate and induce active melanogenesis. **Patients and Methods:** This is an interventional, therapeutic, comparative, study that was done in Department of Dermatology-Baghdad Teaching Hospital, Medical City, Baghdad, Iraq from April 2014-March 2015. Thirty five patient with vitiligo were enrolled in this study, their ages ranged from 5 - 55 ( $22.28 \pm 12.09$ ) years; 15 patients treated with sharp needle, 2 males and 13 females and 20 patients treated with blunt needle, 4 males and 16 females. All clinical types of vitiligo including the generalized, localized and segmental were treated. The number of vitiligo patches varied between patients and the treated patches by sharp needle were 22 and by blunted needle were 20 patches. In both groups, needling was done geometrically, softly and rapidly in systemic horizontal rows away from pigmented margin and pigmented spot inside the patches and was not repeated. In Group A needle gauge 18 hold at 45° to skin surface and the distance between each pricking was 5 - 10 mm and similarly was done in Group B by using blunt needle. Each patient was advised to have daily sun light exposure for at least 15 min. Measuring the surface area of the lesions and calculating the reduction rate was done by using transparent with

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square paper and this was carried out every month till the end of the 4<sup>th</sup> month period of the treatment. All patients in both groups were evaluated every 2 weeks for the 1<sup>st</sup> month and then monthly for 3 months and the rate of reduction in surface area was measured. Also to record any side effects and complications. **Results:** After 2 week, 2 months, and 4 months of treatment, there was 0.5%, 4.31%, and 10% respectively reduction in the surface area of lesions in Group A, while in Group B, there was 7%, 18.42%, and 13.5% respectively reduction in the surface area. **Conclusions:** Pricking the vitiligo skin by needle, gauge 18 gave success rate 10% and 13.5% at four months after therapy and needling could be repeated once a week to accelerate melanogenesis and until get complete repigmentation.

### Keywords

Treatment, Vitiligo, Intra dermal Pricking, Sharp and Blunt Needle

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## 1. Introduction

When medical therapy of vitiligo has failed, surgical treatment is indicated, treating single localized and segmental vitiligo. The aim of all these procedures is to implant melanocytes from the normal skin into vitiliginous areas. These surgical procedures are organ-cultured fetal skin allografting, epidermal culture grafting, melanocyte culture grafting, autologous noncultured melanocyte-keratinocyte cell transplantation, epidermal grafting by the suction blister technique, thin thiersch split skin grafting, or miniature punch grafting. Most methods are time consuming, costly and need sophisticated lab and personnel [1]-[6]. Hence simpler technique non-costly could be suggested like needling technique. The treatment of vitiligo is based on the principles of stimulating the existing melanocytes in the affected area or repopulating it with functioning melanocytes [7]. There have been some reports showing complete repigmentation of vitiliginous patches after repeated needling on them, and by needling from pigmented margins or spots towards white area. Ahmed *et al.* used needling technique by using gauge 30 needle and subjected treated patches 3 times per week for at least 6 months and he prick the dark pigmented margins of vitiliginous patches in order to move the melanocytes to vitiliginous areas achieved 94% repigmentation [8]. While the aim of present work is to apply needling technique by using sharp and blunt needle gauge 18 and by pricking the completely white vitiliginous patches rather than the pigmented margin in order to stimulate residual melanocytes in basal layer and or outer root sheath melanocytes.

## 2. Patient and Methods

Thirty five patient with vitiligo were enrolled in this interventional, comparative, therapeutic study (those with sharp needle 15 patients; 2 males and 13 females) and (those with blunt needle 20 patients; 4 males and 16 females) their age

ranged from 5 - 55 years with mean of 22.28 SD  $\pm$  12.09 years. All clinical types of vitiligo including the generalized, localized and segmental were treated. The number of vitiligo patches varied between patients. So the number of treated patches by sharp needle 22 and by blunted needle 20 patches.

### **2.1. Inclusion Criteria**

Segmental and localized areas of vitiligo were included. In patients with generalized vitiligo some localized areas were selected and treated either because cosmetically unacceptable areas or as the patient requested. Activity of the disease was recorded for each patient to fix the duration of stability of the disease.

### **2.2. Exclusion Criteria**

All patients with active vitiligo either increasing in size of vitiligo lesions or appearance of new lesions at the time of grafting were excluded apart from few patients. All patients stopped their treatment at least two month before intervention. Formal consent was taken from each patient before starting therapy after full explanation about the nature of the disease, the procedure of treatment, follow up, prognosis and the need for pre and post treatment photographs. Also, ethical approval was performed by the Scientific Committee of the Scientific Council of Dermatology and Venereology-Iraqi Board for Medical Specializations. All patients are photographed by Samsung Galaxy S4 combines 13 megapixel camera in the same place and illumination.

## **3. Needling Technique by Sharp and Blunt Needle**

In good illuminated room and patient lie semi-supine position where the upper body is tilted at 45° and not horizontal where the medical gauze, disposable needle gauge 18 sharp one and blunted one, scissor, xylocaine 2% with adrenalin 1:100,000, alcohol and sterile gloves.

In the Group A: 15 patients, 3 males and 12 females with 21 patches were involved (**Table 1**). Photograph has been taken then taken surface area of leuko-dermic patches using transparent paper and graph square papers. Sterilizing area of vitiligenous skin with alcohol and intradermal needling was started geometrically, softly and rapidly in systemic horizontal rows away from pigmented margin and pigmented spot inside the patches. Needle gauge 18 hold at 45° to skin surface was used and the distance between each pricking was ranged from 5 - 10 mm. When pricking was completed the area is again sterilized by alcohol. Each patient was advised to have daily sun light exposure for at least 15 min a day. The Group B included 20 patches in 20 patients, 4 males and 16 females were treated in similar way to group A but using blunt needle (tip cut by a scissor) gauge 18 (**Table 2**).

### **Follow up and Evaluation of Response**

All patients in both groups were evaluated every 2 weeks for the 1<sup>st</sup> month and

**Table 1.** Showing the type of vitiligo, stability of the disease, and the site of pricking in Group A.

No. of patient	Age	Sex	Types of vitiligo	No. of patches	Stability in months	Sites
1	55	Male	Generalized	1	6	Leg
2	11	Female	Generalized	2	3	Back
3	9	Female	Generalized	1	12	back
4	9	Female	Generalized	1	6	Abdomen
5	12	Female	Generalized	1	4	Abdomen
6	5	Female	Generalized	1	3	Back
7	25	Female	Generalized	1	6	Back
8	41	Female	Generalized	1	7	Rt. axilla
9	24	Male	Generalized	2	4	Rt. axilla
10	9	Female	Generalized	2	6	Leg
11	31	Male	Generalized	2	8	Rt. axilla
12	13	Female	Generalized	1	3	Back
13	28	Female	Generalized	1	9	Chest
14	13	Female	Generalized	2	12	Leg
15	8	Female	Generalized	2	2	Buttock

**Table 2.** Showing the types of vitiligo, stability of the disease and the site of pricking in Group B.

No. of pt.	Age	Sex	Types of vitiligo	No. of patches	Stability in months	Site
1	15	Male	Generalized	1	3	Back
2	11	Female	Generalized	1	3	Leg
3	30	Female	Generalized	1	5	Forearm
4	35	Male	Generalized	1	12	Scalp
5	28	Male	Generalized	1	9	Rt. axilla
6	21	Female	Generalized	1	6	Thigh
7	39	Female	Generalized	1	12	Leg
8	16	Male	Generalized	1	2	Leg
9	35	Female	Generalized	1	4	Back
10	18	Female	Generalized	1	3	Leg
11	16	Female	Generalized	1	7	Leg
12	16	Female	Generalized	1	Unstable	Thigh
13	9	Female	Generalized	1	4	Rt. Knee
14	35	Female	Generalized	1	24	Leg
15	40	Female	Generalized	1	Unstable	Leg
16	21	Female	Generalized	1	12	foot
17	32	Female	Generalized	1	12	Leg
18	16	Female	Segmental	1	12	Back
19	35	Female	Generalized	1	Unstable	Leg
20	20	Female	Generalized	1	Unstable	Leg

then monthly for 3 months and the rate of reduction in surface area was measured using transparent with square paper.

Also to record any side effects and complications. For each follow up visits photographs were taken.

#### 4. Results

A total of 35 patients with 42 patches of vitiligo were evaluated during both the treatment and follow up period. They were 7 (20%) males and 28 (80%) females, with female: male ratio 4:1. Their ages ranged from 5 - 55 years with a mean  $\pm$  SD of  $22.28 \pm 12.09$  years.

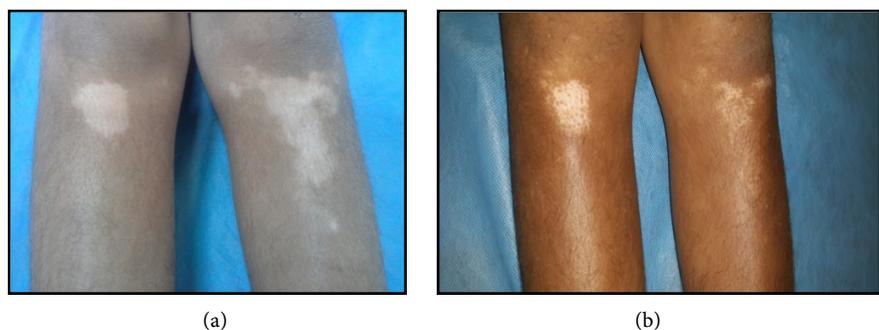
Group A (Sharp needle): included 22 patches in 15 patients. They were 12 (80%) females and 3 (20%) males with a female to male ratio of 4:1, their ages ranged from 5 - 55 years with a mean  $\pm$ SD of  $19.53 \pm 14.30$  years. The surface areas of the patches ranged between 0.5 - 12.5 cm<sup>2</sup> with a mean  $\pm$  SD of  $4.55 \pm 3.55$  cm<sup>2</sup>.

Group B (Blunted needle): include 20 patches in 20 patients. 4 (20%) males, and 16 (80%) females, their ages ranged between (8 - 40) years with a mean  $\pm$  SD of  $24.35 \pm 10.02$  years. The surface area of the patches ranged between 1.5 - 21 cm<sup>2</sup> with a mean  $\pm$  SD of  $4.96 \pm 4.33$  cm<sup>2</sup>.

##### 4.1. Mean of Surface Reduction

The mean  $\pm$  SD of surface area of lesions in Group A was decreased from  $4.55 \pm 3.55$  cm<sup>2</sup> at baseline visit to  $4.48 \pm 3.42$  cm<sup>2</sup> at second visit (after 2 weeks) which was statistically non-significant (p value = 0.317). The mean surface area continued to be reduced till reaching  $4.26 \pm 3.30$  non-significant (p value = 0.068 at 4<sup>th</sup> visit),  $3.85 \pm 3.31$  at 5<sup>th</sup> visit (p value = 0.068) (Table 3, Figure 1).

The mean  $\pm$  SD of surface area of lesions in Group B was decreased from  $4.96 \pm 4.33$  cm<sup>2</sup> at baseline visit to  $4.45 \pm 4.07$  cm<sup>2</sup> at second visit (after two weeks) which was statistically significant (p value = 0.01). The mean surface area continued to be reduced till reaching  $4.00 \pm 3.93$  at 4<sup>th</sup> visit,  $4.22 \pm 4.36$  at 5<sup>th</sup> visit. All were statistically significant when compared to baseline visit (Table 4, Figure 2).



**Figure 1.** Nine years old female showing repigmentation in 2 patches treated by sharp needle Group A ((a) Base line visit; (b) After 4 months).

**Table 3.** The mean differences in patch size before & after needling in Group A.

Variable	Categories	Number	Mean $\pm$ SD	Z	P value
Patch size (cm <sup>2</sup> )	Before needling	22	4.55 $\pm$ 3.55	-1.000	0.317
	2 weeks after needling	22	4.48 $\pm$ 3.42		
Patch size (cm <sup>2</sup> )	Before needling	22	4.55 $\pm$ 3.55	-1.826	0.068
	2 months after needling	22	4.26 $\pm$ 3.30		
Patch size (cm <sup>2</sup> )	Before needling	22	4.55 $\pm$ 3.55	-1.826	0.068
	4 months after needling	22	3.85 $\pm$ 3.31		

**Figure 2.** Nine years old female treated by blunt needle (a); (b) at 1<sup>st</sup> visit and (c) after 4 months of treatment.**Table 4.** The mean difference in patch size before & after needling in Group B.

Variable	Categories	Number	Mean $\pm$ SD	Z	P value
Patch size (cm <sup>2</sup> )	Before needling	20	4.96 $\pm$ 4.33	-2.585	0.01*
	2 weeks after needling	20	4.45 $\pm$ 4.07		
Patch size (cm <sup>2</sup> )	Before needling	20	4.96 $\pm$ 4.33	-3.21	0.001**
	2 months after needling	20	4.00 $\pm$ 3.93		
Patch size (cm <sup>2</sup> )	Before needling	20	4.96 $\pm$ 4.33	-2.692	0.007**
	4 months after needling	20	4.22 $\pm$ 4.36		

\*p value  $\leq$  0.05 was significant. \*\*p value  $\leq$  0.05 was significant. Wilcoxon Signed Ranks Test.

## 4.2. Percent of Reduction

After 2 week, 2 months, and 4 months of treatment there was 0.5%, 4.31% and 10% respectively reduction in the surface area of lesions in Group A, while in Group B there was 7%, 18.42%, and 13.5% reduction in the surface area.

## 4.3. Pattern of Repigmentation

In Group A, the pattern of repigmentation was peripheral and perifollicular in all patients who response to needling. While in Group B, the pattern of repig-

mentation was halo pigmentation.

No side effects or any complications were noticed during treatment and follow up periods.

## 5. Discussion

Each disease might have many alternative therapies that could be used singly or in combination like vitiligo where there are many therapeutic options like medical treatment. But when this fails, surgical implantation of melanocytes could be applied especially in stable localized vitiligo and these techniques are usually non-easy and need experience and costly procedures [1]-[6]. Needling technique has been used as very simple non-costly and could be repeated frequently. The objective of this procedure is to stimulate the marginal melanocytes, by needle pricking, to divide and proliferate and induce new melanogenesis [7].

In present work, needle gauge 18 was used both sharp and blunt in order to induce more damage to the skin but only pricking the vitiliginous skin rather than marginal pigmented area and gave 10% reduction rate for sharp one and 13.5% for blunt one after four months and these results very comparable whether use sharp or blunted needle. This pigmentation was considered high because only one pricking was done. While Ahmed *et al.* used needling technique by using gauge 30 needle and pricking the pigmented margin was carried out 3 times per week for at least 6 months in order to move the melanocytes to vitiliginous areas and gave excellent pigmentation in 94% of treated patches [8]. While in present work pricking was done once to completely vitiliginous areas and if pricking was repeated 3 time per week, it will get much higher rate of repigmentation.

The aim of inducing trauma by pricking is to stimulate both keratinocytes and fibroblast to release inflammatory cytokines and growth factors and these cytokines will stimulate residual melanocytes in vitiliginous area and hair follicles' to multiply, proliferate and migrate into different directions in vitiliginous area and will this induce new melanogenesis [9].

## 6. Conclusion

In conclusion, pricking the vitiligo skin using needle gauge 18 gave reduction rate 10%, 13.5% after one prick and this procedure could be repeated once a week until get complete repigmentation and this needling could be combined with other therapies like sunlight exposure tacrolimus use. Also even patients could be advised to do this procedure by himself using a sharp needle and topical xylocain cream.

## Disclosure

This study was an independent study and not funded by any drug companies.

## Conflicts of Interest

The authors declare no conflicts of interest regarding the publication of this paper.

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