e-ISSN: 0975-1556, p-ISSN:2820-2643

Available online on www.ijpcr.com

International Journal of Pharmaceutical and Clinical Research 2024; 16(4); 829-831

Original Research Article

Autologous Non-Cultured Non-Trypsinised Melanocyte-Keratinocyte Cell Transplantation in Treatment of Stable Vitiligo

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Received: 25-01-2024 / Revised: 23-02-2024 / Accepted: 26-03-2024
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Conflict of interest: Nil

Abstract:

Background: There are several modalities for the treatment of vitiligo but generally they do not result in significant cure of the disease. Autologous non-cultured non trypsinised epidermal cell suspension is simple, less time consuming and does not required special setup.

Aim: To evaluate the Efficacy of Autologous Non-cultured non-trypsinised melanocyte-keratinocyte cell transplantation in treatment of stable vitiligo patches.

Materials and Methods: Patient of age 18 years and above with stable vitiligo, showing no expansion of pre-existing lesion since last 6 months and who are resistant to medical therapy treated with Autologous Non-cultured non-trypsinised melanocyte-keratinocyte cell transplantation technique.

Results: Excellent repigmentation (extent of repigmentation of >75%) response showed by 30% cases, Very good response (extent of repigmentation of 50%-75%) in 46%, Good response (extent of repigmentation of 25-49%) in 16%, Poor response (repigmentation <25%) in 6% at the end 20 weeks post-surgery and good colour match with surrounding pigmented area.

Conclusion: Noncultured nontrypsinized melanocyte keratinocyte transplantation technique is easier, cheaper, less time consuming, less expertise needed and can cover larger body surface area with smaller grafts. This technique produces uniform and cosmetically acceptable pigmentation.

Keywords: Vitiligo, Noncultured Nontrypsinized Melanocyte Keratinocyte Transplantation, Jodhpur Technique.

Introduction

Vitiligo is a pigmentary disorder characterised by depigmentation of the skin that results from a progressive loss of functional melanocytes. It has a profound psychological impact and greatly affects the quality of life [1]. Re-pigmentation of vitiligo patches can be achieved with medical therapy in substantial number of patients.

Various surgical procedures can be done in patients with stable vitiligo who are resistant to medical therapy. Stable vitiligo is described as vitiligo in which there is no expansion of existing lesions and no appearance of new lesions in the past 1 year. [2] Commonly practised surgical procedures include Thiersch graft, [3] mini graft, [4] epidermal cellular grafts, [5] punch grafts, suction blister grafts, [6] melanocyte culture (MC) and grafting [7] and autologous non-cultured melanocyte grafting. [8]

The basic principle of surgical method is to transfer the melanocytes from uninvolved skin to the stable vitiligo patch in the form of either tissue graft or cellular graft. One such grafting technique is the autologous, noncultured nontrypsinized melanocyte–keratinocyte grafting (Jodhpur technique [JT]). [9]

Materials and Methods

This hospital-based, prospective, interventional study was carried out in the JLN medical college dermatology department over 1 year from January 2020 to December 2020, after obtaining the approval of the institutional ethical and research board.

50 patients of stable vitiligo were included in the study by applying the inclusion and exclusion criteria. Written informed consent was taken from all patients included in the study.

Inclusion criteria

1. Age group 18 years and above.
2. Patients with stable vitiligo.
3. Patients who are refractory to medical therapy.
4. Patients who are willing to participate in the study.

Exclusion criteria

1. Age younger than 18 years
2. Patients with active vitiligo
3. Patients with mucosal involvement
4. Pregnancy and lactation
5. Bleeding disorders
6. History of keloidal tendency
7. Patients with unrealistic expectations
8. Patients with active infections.
9. Patients infected with HIV, Hepatitis B, Hepatitis C
10. Patient on immunosuppressive drug.

Technique

Equipment needed for this procedure was micromotor dermabrader/manual dermabrader, spatula/graft spreader, sterile petri dish and ointment-based topical antibiotic (Mupirocin 2%). Lateral area of the thigh was selected as a donor site in all the patients. Hair at the donor site was shaved off. After applying povidone iodine on Donor area it was cleaned with the spirit then it was infiltrated with 2% lidocaine.

This was followed by application of antibiotic ointment to get a high yield of epidermal particles. Dermabrasion was done till pinpoint bleeding was seen. The application of ointment to the donor area helps in efficient trapping of the particles. Dermabrasion was then continued till the upper dermis and then stopped. The paste-like material obtained by this procedure containing melanocytes, keratinocytes and dermis was collected with spatula and was subsequently spread over the recipient area. The donor area to be abraded is one-fourth the recipient area. Recipient site was prepared in the same manner as donor site except no harvesting of epidermal particles was done. The paste-like material obtained from donor site which contained epidermal cells was spread over the recipient area as a thin film and then covered with a collagen dressing followed by small gauze piece of moistened media. Dressing was kept in place with help of bandages. Analgesics and antibiotics cefixime 200 mg BD for 5 days and diclofenac–paracetamol combination BD for 3 days were prescribed. The dressing was removed at first follow-up visit after 7 days. Patient was called for next follow up at 4,8 and 20 weeks. Repigmentation assessment was done by serial digital photographs and grading system.

Results

In our study 50 patients were taken, 52% (26) were males and 48% (24) were females. All patients were above 18 years, with Age overall 28.34±9.81 years. 17 (34%) cases were of segmental vitiligo, 15 (30%) cases were of vitiligo vulgaris, 10 (20%) cases were of focal vitiligo, 7 (14%) cases were of facial vitiligo and 1 case (2%) of acral vitiligo.

After 4–6 weeks, re-pigmentation started all over the patch, and uniform homogeneous pigmentation was noted upto 16–20 weeks. By comparing successive photographs of the treated patches, re-pigmentation was graded as excellent with 75%–100%, very good with 50%–74%, good with 25%–49% and poor with <25% pigmentation of the area treated. Out of 50 patients, 46 (92%) showed improvement whereas there was no or poor response in other patients. 15 (30%) showed excellent improvement, 23 (46%) patients showed very good improvement, 8 (16%) patients showed good improvement and 4 (8%) patients showed poor/no improvement. Immediate side effects included minor burning and pain at both the recipient and the donor sites in nearly 80% of patients who were treated with analgesics. Secondary infection was observed in 1 patient. The most common complication at the donor area was hyperpigmentation, which was seen in 8 (16%) patients. Scarring, Ulceration, itching, and koebnerization were not seen in any patient.

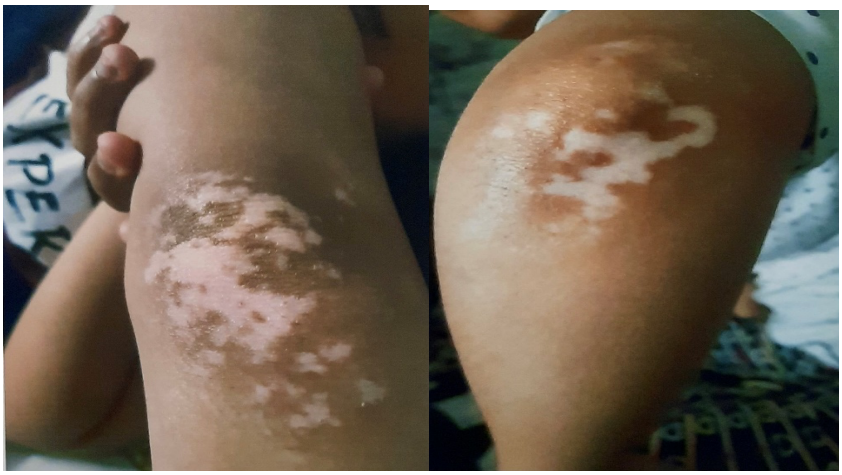

Figure1: before and after treatment

Discussion

Several surgical modalities are currently available for the treatment of vitiligo. Despite the limitations and some side-effects, surgical modalities appear to be the method of choice in recalcitrant stable vitiligo. We used autologous, noncultured nontrypsinized, melanocyte–keratinocyte grafting also known as Jodhpur technique (JT).

In our study excellent response showed by 15(30%), Very good response showed by 23(46%), Good response was shown by 8(16%), Poor response showed by 3(6%), while 0% response was showed by 1 (2%) cases. Similar to the study conducted by Mulekar et al. [10] which used autologous noncultured trypsinised cellular grafting technique and reported more than 65% repigmentation in 61% of patients.

In a study by Kachhawa et al [8] using Jodhpur technique in 437 vitiligo patches, more than 75% re-pigmentation (excellent improvement) was seen in 41% of the patches. Verma et al. [11] in a comparative study of cultured versus non-cultured melanocyte technique reported more than 70% re-pigmentation in 61% of patches with autologous melanocyte-rich suspension (AMRCS) and 52% of patches with MC technique.

Pandya et al. [7] reported an excellent response in 52.17% of cases with AMRCS technique and in 50% with the MC technique. Maleki et al. [6] in their pilot study on suction blister grafting technique reported complete re-pigmentation in 70% of the cases.

After 20 weeks of follow up of repigmented area 90% cases showed colour match of repigmented area with surrounding skin, and Hyper-pigmented repigmented area in 8% and No response shown by 2% cases. Quality of pigment is better initially but more homogenous with the time, similar to the study conducted by Quezada et al.

Conclusion

It is easier, cheaper, less time consuming, less expertise need to perform this surgery. This technique produces uniform and cosmetically acceptable pigmentation. There is no scarring at the donor site and no cobblestone pigmentation of the recipient area.

Declaration of patient consent: The authors certify that they have obtained all appropriate patient consent forms

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