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BIOFILLERS VERSUS HYALURONIC ACID IN PATIENTS WITH POST-ACNE SCARS

Mahtab Khawajakhail[1], Sara Inayat[2], Sehrish Ghani Tareen[3], Durrya Tareen[4], Tatara Khan[5]

[1.] Post Graduate Student FCPS Dermatology Sandeman Provincial Hospital / Bolan Medical Hospital / College, Quetta.
[2.] Professor FCPS Dermatology Sandeman Provincial Hospital / Bolan Medical Hospital / College, Quetta.
[3.] Consultant Dermatologist FCPS Sandeman Provincial Hospital / Dermatology Bolan Medical Hospital / College, Quetta.
[4.] Post Graduate Student FCPS Dermatology Sandeman Provincial Hospital / Bolan Medical Hospital / College, Quetta.
[5.] Post Graduate Student FCPS Dermatology Sandeman Provincial Hospital / Bolan Medical Hospital / College, Quetta.
*Corresponding Author: Mahtab Khawajakhail, Email**:** khawajakhailmahtab@gmail.com

ABSTRACT

Objective: To compare the effectiveness, safety and satisfaction results of autologous biofillers to HA fillers in patients with post-acne atrophic scars.

Methodology: It is a Prospective comparative study performed at the Department of Dermatology, Sandeman Provincial Hospital / Bolan Medical Hospital / College Quetta, a tertiary care hospital after obtaining the approval from the institution's ethical review committee (CPSP/REU/DER-2023-001-19348). The study period is 3 months starting 10 January to 09 April, 2026. Patients between 18 to 45 years of age who have been clinically diagnosed with post-acne atrophic scars were grouped based on the type of fillers used into two therapies Group A received autologous biofillers while Group B received hyaluronic acid fillers. Severity of acne scars was determined with the qualitative Goodman and Baron acne scar grading before treatment and at follow-up visits. The effects of treatment, side effects and patient satisfaction were documented and statistically analyzed.

Results: Both treatments had significant improvements in post acne scars. While hyaluronic acid fillers took effect right away and provided immediate cosmetic correction, Biofillers provided long-term patient satisfaction and volumetric improvements were maintained over time. The change was statistically significant between Group 1 and Group 2 ($p<0.05$) in terms of an improvement of acne scar grading scores. The most common reaction were transient erythema and edema; no significant reactions were seen.

Conclusion: To treat post-acne atrophic scars, there are effective treatments, such as the incorporation of autologous biofillers and hyaluronic acid fillers. Biofillers can be an affordable option that lasts longer than others and hyaluronic acid fillers may help cosmetically create that look fast.

KEYWORDS: Acne scars, Biofillers, Hyaluronic acid, Atrophic scars, Dermal fillers, Cosmetic dermatology.

INTRODUCTION

Post-acne scarring is a live concern in cosmetic dermatology because scarring acne occurs in up to 95% of patients with moderate to severe acne,[1] resulting in significant cosmetic, psychological, and social consequences[2] that often stem from acne itself, even though it can often be controlled by medical therapy[3,4].

The etiology of acne scarring is complex, multifaceted,[5] and the scarring often exhibits different morphologies, making treatment of post-acne scars challenging and typically requiring a multimodal approach.[6,7]

The goal of effective treatment using dermal fillers for acne scars is to minimize and improve atrophic scars by restoring lost skin volume and lifting down depressed skin, improving overall skin contour and texture.[8,9]

One of the most frequently used dermal fillers in cosmetics is hyaluronic acid (HA) fillers.[10] Although established in practice, HA fillers do have some drawbacks, such as a costlier treatment than other options on the market, they last for a shorter period of time following injections[11], they require repeat injections, and some side effects have been experienced, including swelling, bruising, nodularity and vascular problems[12].

Thus, in recent years, the concept of producing biofillers from the plasma proteins of their own subjects, by using thermal modification and chemical modification techniques, is recognized as an innovative and low cost alternative to commercially available dermal fillers[13,14], which are composed of synthetic substances, such as hyaluronic acid or silicone, with unknown toxicity levels.[15] Biofillers can also stimulate collagen production and tissue regeneration, which can enhance their efficacy in augmenting tissue immediately, while also increasing production of growth factors and bioactive proteins that can further help in tissue regeneration. [16,17]

While promising results have been shown for the use of biofillers in the management of post-acne scars,[18] there had been no direct comparison between the use of biofillers and HA fillers in post-acne scar care in the local population.[19]

Moreover, different treatment protocols, scar grading systems and follow-up periods have led to varying results in publications. [20]
Comparative evaluation of these two modalities is clinically important, given the rising trend for minimally invasive cosmetic procedures and also the requirement of cost-effective treatment modalities. Thus, this research was designed to study efficacy, safety and satisfaction profile of patients with post acne atrophic scars in terms of response to Violette biofillers versus HA fillers, which were professionally presented to the department of dermatology in Sandeman Provincial Hospital / Bolan Medical Hospital / College, Quetta.

METHODOLOGY

This prospective comparative study was conducted in the Department of Dermatology at Sandeman Provincial Hospital / Bolan Medical Hospital / College, Quetta, also a tertiary care hospital and this study was approved by Institutional ethical review committee (CPSP/REU/DER-2023-001-19348). The study period was 3 months, starting date: January 10, 2026 and ending date: April 09, 2026. Prior to enrolment, all participants gave written informed consent and confidentiality of patient information was ensured throughout the study.
The study included patients aged 18 to 45 years old both male and female presented with clinically diagnosed post-acne atrophic scars. The following patients were excluded: those with active acne, hypertrophic or keloidal scars, history of bleeding disorders, autoimmune diseases, uncontrolled diabetes mellitus, active skin infections, pregnancy, lactation, or history of hypersensitivity to filler materials, or patients who had received acne scar treatment within the previous three months.
Sample size was obtained from the calculated sample size calculator provided by the WHO by assuming 95% confidence level, power of 80 and assuming treatment effect of difference between the two groups based on previous studies. Patients, who had fulfilled the inclusion criteria were recruited by non-probability consecutive sampling technique in two groups of 60 each.
Group A patients were treated with the biofillers that are available from their own body and Group B patients with hyaluronic acid fillers. All the details regarding the demographic information of the subject such as age, gender etc. and the duration of acne scars and previous treatments were documented in a predesigned proforma. Standardized lighting images were captured of the patients before therapy to create baseline clinical photographs.
Acne scars severity was evaluated using Goodman and Baron qualitative acne scar grading system[6] and all procedures was conducted under aseptic condition with qualified dermatologist. The presence of topical anesthetic cream with lidocaine-prilocaine was applied 45 minutes before the procedure.
About 20 ml of venous blood was aspirated in sterile conditions from each member of Group A, for preparation of autologous biofillers. Centrifugation was performed on blood samples to isolate the platelet-poor plasma and thermal processing was used to obtain plasma gel biofillers from the platelet-poor plasma. Appropriate injection techniques were used to introduce the leveled biofillers intradermal and subdermal into atrophic acne scars.
In Group B the commercially manufactured cross linked hyaluronic acid filler was injected into the atrophic scars using puncture threading serially step technique based on scar depth and integrity according to its morphology. In both groups, a protocol of post-procedure regimen (including recommendations for sun protection, avoidance of excessive facial manipulation and for cold compresses) was indicated.
Patients were followed up on monthly increments (baseline, 4, 8, and 12 weeks following treatment). The clinical improvement was evaluated by the comparison of the base line and treatment Goodman and Baron scar grade, standardized photographs and physician global assessment. Patient Satisfaction is assessed by visual analog scale (0-10).
The following adverse effects were monitored in the safety assessment: Pain, erythema, edema, bruising, nodules, infection, hypersensitivity reactions, and vascular complications. Follow-up visits were carried out and any complications noted were documented and managed appropriately.
Data were entered and analyzed with the help of Statistical Package for Social Sciences (SPSS) version 27. The quantitative variables (e.g. age, scar duration) were presented as mean, and SD, while the qualitative variables (e.g. gender, scar grades) were presented as frequencies and percentages. Independent sample t test and chi square test were used to compare groups. A p-value of ≤ 0.05 was regarded as the level of statistical significance.

RESULTS

A total of 60 patients with post-acne atrophic scars took part in the study, and all of them finished the follow-up period. The patients were split equally between the two groups: 30 patients in group A (autologous biofiller group) and 30 patients in group B (hyaluronic acid filler group). The mean age of participants in Group A was 27.43 ± 5.62 years, while in Group B it was 28.17 ± 6.01 years. No statistically significant difference was found between the two groups with regard to age, gender distribution, length of acne scars or base line acne scar severity ($p>0.05$).

Table-I: Baseline demographic and clinical characteristics of study participants.

Variables	Group A (Biofillers) n=30	Group B (Hyaluronic Acid) n=30	P-value
Mean age (years)	27.43 ± 5.62	28.17 ± 6.01	0.621
Male gender	18 (60%)	17 (56.7%)	0.793
Female gender	12 (40%)	13 (43.3%)	0.793
Mean duration of scars (years)	4.12 ± 1.84	4.39 ± 2.01	0.584
Goodman & Baron Grade II	9 (30%)	10 (33.3%)	0.781
Goodman & Baron Grade III	16 (53.3%)	15 (50%)	0.796
Goodman & Baron Grade IV	5 (16.7%)	5 (16.7%)	1.000

Improvements in clinical parameters were seen for both treatment arms at follow-up. After treatment, grading of scars on the acne lesion was reduced in both groups in a statistically significant fashion ($p<0.05$). The group A, however, had a relatively greater improvement at the 12 weeks post follow-up.

Table-II: Comparison of mean Goodman and Baron acne scar grades before and after treatment.

Time Interval	Group A (Biofillers) Mean ± SD	Group B (Hyaluronic Acid) Mean ± SD	P-value
Baseline	3.02 ± 0.67	3.05 ± 0.64	0.852
4 weeks	2.41 ± 0.58	2.32 ± 0.61	0.564
8 weeks	1.96 ± 0.53	2.04 ± 0.56	0.579
12 weeks	1.48 ± 0.49	1.79 ± 0.57	0.028

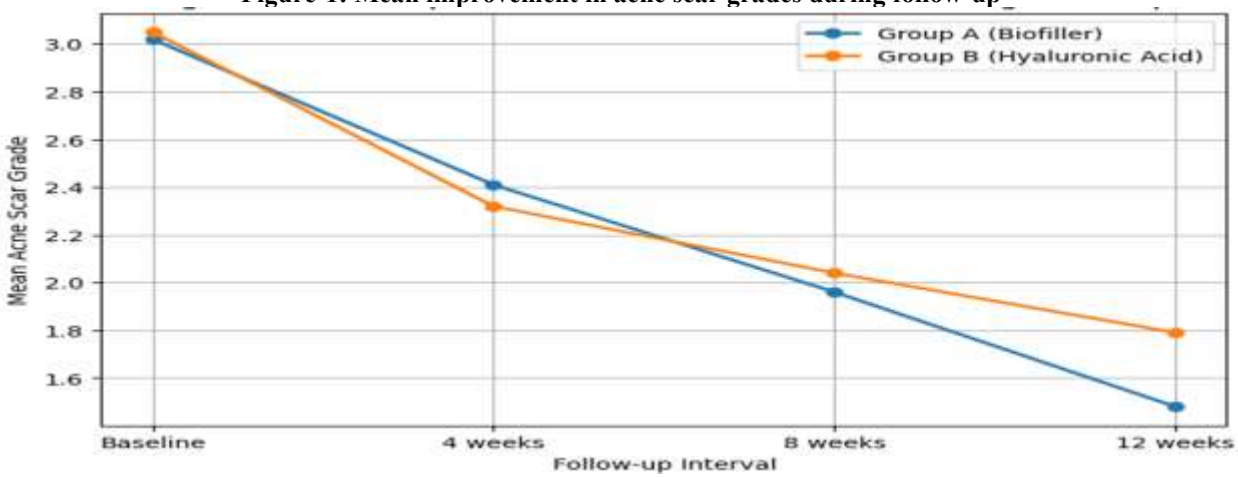
At the end of the study period, after evaluating the improvement by the physician's global assessment, there was an excellent improvement in 40% of patients in Group A, and 26.7% in Group B, respectively. Moderate improvement was observed in 46.7% of patients in Group A and 50% of patients in Group B, respectively.

Table-III: Physician global assessment of treatment response at 12 weeks.

Treatment Response	Group A (Biofillers) n (%)	Group B (Hyaluronic Acid) n (%)
Excellent improvement (>75%)	12 (40%)	8 (26.7%)
Good improvement (50–75%)	14 (46.7%)	15 (50%)
Mild improvement (25–49%)	3 (10%)	5 (16.7%)
Poor improvement (<25%)	1 (3.3%)	2 (6.6%)

The patients' satisfaction ratings for both the composite and OEALIN groups were high at the end of the follow-up. Visual analog scale mean patient satisfaction score was 8.23 ± 1.14 in Group A and 7.31 ± 1.27 in Group B which was statistically significant (p=0.006).

Figure-1: Mean improvement in acne scar grades during follow-up



Tolerance of both treatment modalities was excellent. Common side effects of the vaccine were transient erythema and edema. Both groups displayed no severe hypersensitivity reaction, vascular occlusion or necrosis of the skin.

Table-IV: Frequency of adverse effects among study participants.

Adverse Effects	Group A (Biofiller) n (%)	Group B (Hyaluronic Acid) n (%)	P-value
Erythema	7 (23.3%)	9 (30%)	0.559
Edema	5 (16.7%)	8 (26.7%)	0.347
Bruising	3 (10%)	4 (13.3%)	0.688

Procedural pain	6 (20%)	7 (23.3%)	0.754
Nodularity	1 (3.3%)	2 (6.7%)	0.554
Major complications	0	0	--

The overall results of the most effective treatment types for post-acne atrophic scars was more favorable for the use of the biofillers (autologous) and hyaluronic acid fillers. At 12 weeks' follow-up, however, the sustained improvement and increased patient satisfaction favored biofillers.

DISCUSSION

Post-acne atrophic scars are difficult-to-treat, visually and socially burdensome skin conditions. The efficacy and safety of the autologous biofillers were compared with the efficacy and safety of hyaluronic acid dermal fillers in the patients of the present study with post-acne atrophic scars. The results were clinically relevant outcomes of scar appearance for both the treatment modalities, indicating that injectable fillers can provide a minimally invasive and effective treatment modality in the management of acne scars.

This study showed that both groups experienced an improvement in Goodman and Baron acne scar grading scores during the study period.[21,22] The sustained improvement again showed relatively higher results in patients receiving treatment with bio fillers from the same source (autologous) at 12 weeks after therapy. Such results and improvements in the regeneration and volume backs fillers of autologous plasma gel is in accordance with previous studies that reported favorable regenerative and volume effects in atrophic scars and facial rejuvenation of biofillers that persisted for a longer period of time, which seemed to be due to collagen stimulation and tissue remodeling caused by plasma proteins and growth factors.

As for acne scars, their appearance was greatly enhanced by the hyaluronic acid fillers, especially in their early stage of use. The hydrophilic property of HA leads to the elevation and volume of sunken scars in a speedy fashion, and plasticizes have reported appreciable cosmetic results within a couple of weeks of HA injection in acne scars. [23]

Higher and statistically significant levels of patient satisfaction were observed in the biofillers group than in hyaluronic acid group in this study. This could be a consequence of the apparent longer-lasting clinical efficacy and reduced procedural expenses of biofillers that are PORTS/auto-generated.[24] Due to the fact that biofillers are derived from a patient's blood plasma, hypersensitivity reaction and immunogenic complications is minimal and proves to be an economical advantage to previous investigators.

With respect to the safety profile, the treatment groups had low numbers of mild adverse reactions in the trial. The most frequently cited adverse effects in both groups were mild erythema, edema, bruising, and transient pain. Major complications (vascular occlusion or skin necrosis) were not reported. The results are similar to those previously published in other studies showing good safety results with HA fillers and autologous biofillers, in the hands of trained dermatologists using an aseptic procedure. [14,25]

Several strengths of the present study are worth noting: It is prospective, it involves a comparative design, it includes a standard grading of the scar, and it includes the follow-up assessment at regular intervals. However, there are some restriction that one needs to recognize. The study was performed in a single tertiary care center among a limited sample size and duration of follow-up. Furthermore, instrumental methods for the objective assessment of scars were not called upon. Multimode studies of longer follow-up duration and more patients are suggested for further investigation of the efficacy and repeatability of autologous biofillers in the treatment of acne scars.

Finally, both types of biofillers (autogers and HA) were effective and safe to treat atrophic scars from past "acne. In terms of short-, medium-, or long-term clinical outcomes, however, biofillers exhibited more favorable clinical outcomes and greater patient satisfaction, indicating that they could become a cost-effective alternative to traditional hyaluronic acid fillers, especially in resource-limited areas.

CONCLUSION

Both autologous biofillers and hyaluronic acid are proven to be safe and effective, both autologous biofillers and hyaluronic acid fillers turned out to be effective and safe treatment modalities for post acne atrophic scars. Patient satisfaction and clinical improvement were comparatively more in the group which received the autologous biofillers and the results were seen to be more sustained, at the end of follow-up, in the group treated with the autologous biofillers. Comparative better clinical improvement and higher patient satisfaction were achieved with autologous biofillers at the end of follow-up. Furthermore, biofillers also had the benefit of being biocompatible and inexpensive, and, due to their "autologous" nature, with little risk of hypersensitive reaction.

Due to the quick cosmetic correction and early noticeable improvement, hyaluronic acid fillers proved to be a good choice for immediate cosmetic enhancement. However, they are not as effective as long lasting and are expensive, and may not be useful in some patients over the long term.

Autologous biofillers could be a potential alternative to the commercially available HA fillers in the treatment of PAS with favorable outcomes at a lower cost in resource restricted health care institutions, as revealed by this study.

Extended multicenter trials with more participants and a longer time of follow-up are advised to demonstrate long-term effectiveness, safety, and regenerative properties of biofillers in aesthetic dermatology.

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