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COMPARATIVE EVALUATION OF CLINICAL EFFICACY AND SAFETY OF SALICYLIC ACID VERSUS MANDELIC ACID PEEL IN ACNE VULGARIS: A PROSPECTIVE SPLIT-FACE STUDY

Kunal Yadav — Department of Pharmacology, Hamdard Institute of Medical Sciences and Research, New Delhi, India

Razi Ahmed — Department of Pharmacology, Hamdard Institute of Medical Sciences and Research, New Delhi, India

Mukesh Manjhi — Department of Dermatology, Hamdard Institute of Medical Sciences and Research, New Delhi, India

ABSTRACT **Background:** Acne vulgaris is a chronic inflammatory disorder of the pilosebaceous unit associated with significant physical and psychological morbidity. Chemical peels are widely used as effective procedural therapies. **Objective:** To compare the clinical efficacy and safety of salicylic acid and mandelic acid peels in patients with moderate to severe acne vulgaris. **Methods:** A prospective split-face study was conducted on 64 patients aged 18–45 years. Salicylic acid peel was applied to the left side of the face, while mandelic acid peel was applied to the right side. Treatments were administered every two weeks for six sessions. Efficacy was assessed using acne severity scores, and safety was evaluated based on adverse drug reactions. Statistical analysis was performed using repeated measures ANOVA. **Results:** Both treatments showed significant improvement in acne severity ($p < 0.05$). Salicylic acid demonstrated superior efficacy, with greater reduction in acne scores. Mandelic acid exhibited an excellent safety profile, with no reported adverse effects, whereas salicylic acid showed mild and transient erythema and photosensitivity. **Conclusion:** Salicylic acid is more effective in reducing acne severity, while mandelic acid offers superior safety and tolerability. Treatment selection should be individualized based on patient characteristics.

KEYWORDS : Acne Vulgaris; Salicylic Acid; Mandelic Acid; Chemical Peel; Split-face Study; Dermatology

INTRODUCTION

Acne vulgaris is a multifactorial inflammatory disorder involving increased sebum production, follicular hyperkeratinization, colonization by Cutibacterium acnes, and inflammatory processes [1,4]. It affects approximately 9.4% of the global population and is highly prevalent among adolescents and young adults [1,5].

Conventional therapies, including topical retinoids, benzoyl peroxide, systemic antibiotics, and oral isotretinoin, are effective but often associated with adverse effects, poor compliance, and antibiotic resistance [2,6]. This has led to increased interest in procedural therapies such as chemical peeling.

Chemical peels promote exfoliation, reduce follicular plugging, and exert anti-inflammatory effects, making them effective in acne management [3,7]. Salicylic acid, a beta-hydroxy acid, is lipophilic and penetrates sebaceous follicles effectively, providing comedolytic and anti-inflammatory effects [3,6]. Mandelic acid, an alpha-hydroxy acid, has a larger molecular size, leading to slower penetration and reduced irritation, making it suitable for sensitive skin [3,7].

Materials and Methods

Study Design

This was a prospective, comparative split-face study conducted at a tertiary care hospital in New Delhi.

Study Population

A total of 64 patients aged 18–45 years with moderate to severe acne vulgaris were included.

Inclusion Criteria

- Patients aged 18–45 years
- Moderate to severe facial acne

Exclusion Criteria

- Pregnancy or lactation
- Active skin infections
- History of hypersensitivity
- Recent isotretinoin use

Procedure

Salicylic acid peel was applied to the left side of the face and mandelic acid peel to the right side. Treatments were repeated every two weeks for six sessions.

Outcome Measures

- Acne severity score
- Adverse drug reactions (photosensitivity, erythema)

Statistical Analysis

Data were analyzed using repeated measures ANOVA. A p-value < 0.05 was considered statistically significant.

RESULTS

A total of 64 patients completed the study, with a mean age of 23.09 ± 3.76 years.

Both salicylic acid and Mandelic acid peels demonstrated significant improvement in acne severity over six sessions ($p < 0.05$).

Salicylic acid showed greater improvement in acne scores compared to Mandelic acid, indicating superior efficacy.

In terms of safety, salicylic acid was associated with mild adverse effects such as erythema and photosensitivity, which decreased over time. Mandelic acid showed no adverse drug reactions, demonstrating excellent tolerability.

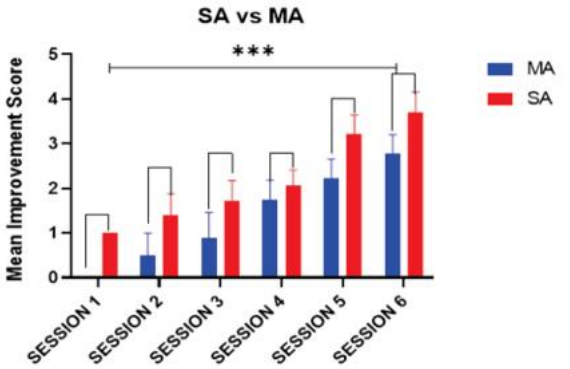

Figure 1: Comparison of Salicylic Acid and Mandelic Acid Peel Efficacy Across Six Treatment Sessions

Table 1: Comparison of Adverse Drug Reactions Across Six Treatment Sessions (N = 64)

ADR Status	Session 1 n (%)	Session 2 n (%)	Session 3 n (%)	Session 4 n (%)	Session 5 n (%)	Session 6 n (%)
Absent	45 (70.3%)	52 (81.3%)	57 (89.1%)	61 (95.3%)	62 (96.9%)	63 (98.4%)
PH	11 (17.2%)	6 (9.4%)	5 (7.8%)	3 (4.7%)	2 (3.1%)	1 (1.6%)
PH/ER	8 (12.5%)	6 (9.4%)	2 (3.1%)	0 (0%)	0 (0%)	0 (0%)

Total	64 (100%)	64 (100%)	64 (100%)	64 (100%)	64 (100%)	64 (100%)

DISCUSSION

This study demonstrates that both salicylic acid and mandelic acid peels are effective in the management of acne vulgaris.

The superior efficacy of salicylic acid can be attributed to its lipophilic nature, which allows deeper penetration into sebaceous follicles, enhancing comedolysis and reducing inflammation.

Mandelic acid, due to its larger molecular size, penetrates the skin more slowly, resulting in reduced irritation and a better safety profile. This makes it particularly suitable for patients with sensitive skin and darker skin types who are prone to post-inflammatory hyper-pigmentation.

The split-face design is a major strength of this study, as it eliminates inter-individual variability. However, limitations include a relatively small sample size and lack of long-term follow-up.

CONCLUSION

Both salicylic acid and mandelic acid peels are effective treatment options for acne vulgaris. Salicylic acid offers superior efficacy, whereas mandelic acid provides better safety and tolerability. Treatment should be individualized based on patient needs and skin type.

Ethical Approval

The study was approved by the Institutional Ethics Committee of Hamdard Institute of Medical Sciences and Research, New Delhi, and conducted in accordance with the Declaration of Helsinki.

Informed Consent

Written informed consent was obtained from all participants.

Conflict of Interest

The authors declare no conflict of interest.

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