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COMPARATIVE EFFICACY OF TCA 15% PEEL AND TRETINOIN 0.05% CREAM FOR KERATOSIS PILARIS: A RANDOMIZED CLINICAL TRIAL

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ABSTRACT- Keratosis pilaris (KP) is an inherited abnormality of keratinization affecting the follicular orifices with keratotic follicular plugging, perifollicular erythema and follicular atrophy, particularly on the extensor aspects of the upper arms, thighs, and on the buttocks. The prevalence of KP varies from 15% to 40%, often beginning in early childhood. It is a cosmetically concerning skin condition that can be treated with emollients, keratolytics, topical steroids, chemical peels, topical or systemic retinoids, and various laser or light-based therapies which have been tried with variable success. Here we are comparing TCA 15% chemical peel vs Tretinoin 0.05% cream for the treatment of keratosis pilaris.

Keywords- KP(Keratosis Pilaris), TCA 15% peel, Tretinoin 0.05% cream

OBJECTIVES- To compare the efficacy of TCA (Trichloroacetic acid) 15% peel versus Tretinoin 0.05% cream in the management of keratosis pilaris.

2. To evaluate patient satisfaction and subjective perceptions of treatment efficacy and tolerability

METHODOLOGY- A prospective, randomized clinical study with study duration of 8 weeks. 20 Patients with KP were alternately assigned for treatment with TCA 15% chemical peel(group A) and Tretinoin 0.05% cream(group B) . TCA 15%peel was applied at the involved sites at first visit, every 2 weeks thereafter until 8 weeks. Tretinoin 0.05% cream was instructed to be applied over the involved area at night. Assessment was done using clinical photographs at 1st visit and then comparing them with 4 week and 8 week follow up period. The treated sites were assessed using investigator's global assessment (IGA) scale for hyperkeratotic papules and erythema was used and graded from 0-4. At the end of treatment, patients rated their overall satisfaction with the treatment as very satisfied, satisfied, slightly satisfied, or unsatisfied.

RESULTS- At the end of 4 weeks and 8 weeks, both the groups A and B had similar efficacy in management of Keratosis Pilaris.

CONCLUSION- TCA 15 % peel and Tretinoin 0.05% cream are equally efficacious in managing keratosis pilaris and could be potential treatment options based on patients' preference.

INTRODUCTION

Keratosis pilaris (KP) is a common and benign follicular condition characterized by follicle-centred papules, often appearing in early childhood. It affects a significant proportion of adolescents (50-80%) and adults (up to 40%) globally. KP's precise etiology remains unclear, but it is believed to involve a defect in the keratinization process leading to follicle plugging. The defective fillagrin (FLG) gene is implicated in KP lesions, promoting keratinocyte proliferation and inflammation. KP has a genetic component and is inherited in an autosomal dominant pattern with varying penetrance. Thomas et al. [1] propose that KP is not a primary disorder of keratinocytes but rather a hair shaft disorder. According to him, KP occurs when coiled hair shafts rupture the follicular epithelium, causing defective follicular keratinisation and inflammation. Additionally, Gruber et al. [2] postulated that both abnormal keratinisation and hair shaft abnormalities can be explained by the absence of sebaceous glands in an early step of KP pathogenesis. Subtypes include erythromelanosis follicularis faciei et colli (EFF), and keratosis pilaris atrophicans (KPA) etc. While often asymptomatic, KP can cause psychosocial distress and reduced quality of life. Treatment modalities range from topical emollients and keratolytic agents to chemical peels, laser therapy etc . Here we are comparing the efficacy of TCA chemical peel which acts as a keratolytic agent, promoting exfoliation, and Tretinoin, a retinoid that enhances cellular turnover and promotes the normalization of follicular epithelial proliferation in the management of Keratosis Pilaris.

OBJECTIVES-

1. To compare the efficacy of TCA (Trichloroacetic acid) 15% peel versus Tretinoin 0.05% cream in the treatment of keratosis pilaris.

2. To evaluate patient satisfaction and subjective perceptions of treatment efficacy and tolerability

MATERIALS AND METHODS-

This study was conducted in the Department of Dermatology, Venerology and Leprosy in Saveetha Medical College from January 2024 to April 2024 after Ethical committee approval. This was a randomized controlled trial which enrolled 20 patients who were randomly assigned to receive either TCA 15% peel (Group A) or Tretinoin 0.05% cream (Group B).

Inclusion criteria- 1. clinical diagnosis of keratosis pilaris at any site (arms, buttocks, thighs etc)

2. no other systemic illness or comorbidities.

Exclusion criteria-1. allergic to the formulations

2. pregnant or lactating women

3. usage of topical therapy (corticosteroids/ tretinoin) within 1 month prior to the study

4.receiving concurrent systemic therapy with corticosteroids or retinoids.

Procedure- 20 Patients with KP were alternately assigned for treatment with TCA 15% chemical peel and Tretinoin 0.05% cream. TCA 15%peel was done at first visit, after 2 weeks and every 2 weeks thereafter until 8 weeks. It was applied on the involved area until frosting seen and neutralised with a neutraliser. Tretinoin 0.05% cream was instructed to be applied over the involved area at night. Assessment was done using clinical photographs at 1st visit and then comparing them with 4 week and 8 week follow up period.

TOOLS - The treated sites were assessed using investigator's global assessment (IGA) scale for hyperkeratotic papules and erythema and graded from 0-4 (0=no improvement, 1= 0-25%, mild improvement, 2= 26 – 50%, moderate improvement, 3= 51-75%, marked improvement, 4= >76%, excellent improvement). To evaluate the impact on quality of life, a comprehensive quality of life questionnaire was employed. At the end of treatment, patients rated their overall satisfaction with the treatment as very satisfied, satisfied, slightly satisfied, or unsatisfied.

STATISTICAL ANALYSIS

The data was analysed with SPSS statistics and in MS-Excel 2007. P values were calculated using appropriate tests and values of $P < 0.05$ was considered as statistically significant.

RESULTS

The study included 20 patients with a balanced distribution between the two groups, ensuring comparable baseline characteristics.

Characteristic	Group A(TCA 15%)	Group B (Tretinoin 0.05%)
Age (mean ± SD)	25.5 ±3.67	25.2 ±3.81
Gender(male: female)	4:6	5:5

Table 1- shows the characteristics of age and gender in the study groups. According to statistical analysis, the two groups are comparable since there is no statistically significant difference in 2 groups.

At the end of 4 and 8 weeks grading was done using IGA scale for improvement in keratotic papules and erythema.

At the end of 4 weeks in TCA group -7 of 10 patients had mild improvement in TCA group, 1 of 10 had moderate improvement, 2 of 10 had no improvement. In Tretinoin group , 6 of 10 patients had mild improvement, 4 of 10 had no improvement.

At the end of 8 weeks in TCA group -5 out of 10 patients had mild improvement in TCA group, 4 of 10 had moderate improvement, 1 of 10 had marked improvement. In tretinoin group 7 out of 10 patients had mild improvement in group, 3 of 10 had moderate improvement

After performing the Fishers exact test, P value at 4 weeks and 8 weeks assessment was **0.470 and 0.314** respectively indicating no significant difference in the distribution of improvement levels between the TCA treated group and the tretinoin-treated groups(p value > 0.05)

In our study Family history of KP was present in 20% cases. Atopy history was found in 30% of our cases.

Three patients(30%) in each of the groups experienced minimal side effects, such as erythema and a burning sensation.

At the end of 8 weeks, 40% of patients in both groups were very satisfied with the treatment and 10% of patients in both the groups were unsatisfied with the outcome.

Quality of life questionnaire assessment revealed 50% of the patients were bothered by the rash.

DISCUSSION

According to a study by Poskitt and Wilkinson (1994) [3] incidence of Keratosis pilaris was highest in the first decade of life and decreased with age. Our study demonstrated increased incidence in second decade of life. Marqueling et al.[4] also reported that KP begins in childhood with no known gender or racial predilection . Similar to our study, Kootiratrakarn et al. (5), showed that over 40% of individuals with KP undergo a significant effect on their self-perception and overall psychosocial well-being. Breithaupt et al. [6] and Tatavarthi et al. [7] used a 3-point scale to assess KP treatment sites, grading as mild, moderate, or severe.

Park et al. [8] in 2011 and Lee et al. [9] used global improvement scale (GIS). This was evaluated using a quartile grading scale where grade 1 = 75% improvement on two categories: skin texture and dyspigmentation. Additionally, In his research, Park et al. [8] employed a Mexameter to assess erythema and melanin index levels. In a study by Sobhi et al.[10] patients had KP treated with either QS Nd:YAG laser (area A), fractional CO2 laser (area C) and a combination of both fractional CO2 and QS Nd: YAG. Equal number of patients experienced a 25% improvement in follicular prominence and pigmentation with no significant difference between three areas . Several other studies have demonstrated the efficacy of fractional CO2 laser in KP treatment using a global assessment grading for erythema, pigmentation and skin texture. Lee et al.[9] investigated the use of pulse dye laser (PDL) at 595 nm in the treatment of classic KP. This was performed in combination with a 755 nm long pulse Alexandrite laser and microdermabrasion.

Among Topicals used for keratosis pilaris : Bogle, Ali, & Bartel [11] studied Tazarotene 0.05% cream for KP which improved erythema and roughness compared to placebo group. Kootiratrakarn et al. [5] showed that 10% lactic acid should be chosen as standard treatment for KP in preference to salicylic acid in the view of its higher efficacy. Yang et al [12] in his study with 20% azelaic acid vs cetaphil moisturizing cream for KP, showed improvement with both azelaic acid and moisturizing cream.

Our study was the first study in the existing literature comparing TCA 15% peel and Tretinoin 0.05% cream for management of KP. Similar efficacy in both treatments in improving the clinical manifestations of KP, as assessed by the Investigator's Global Assessment (IGA) scale suggests that both modalities can be considered viable options for KP management. The favourable patient satisfaction rates observed in this study highlight the importance of addressing not only the clinical manifestations of KP but also the psychosocial aspects that may significantly impact patients' quality of life. By documenting family history of KP and history of atopy in the patient population, my study acknowledges the potential influence of genetic factors and atopic conditions in keratosis pilaris.

CONCLUSION

Our study demonstrates that both TCA 15% chemical peel and Tretinoin 0.05% cream are effective treatments for keratosis pilaris, showing comparable outcomes over a 8-week period assessed by IGA(Investigators global assessment) score. Patient satisfaction rates further support the efficacy of these modalities. These findings provide insights in selecting appropriate treatment options for keratosis pilaris patients.

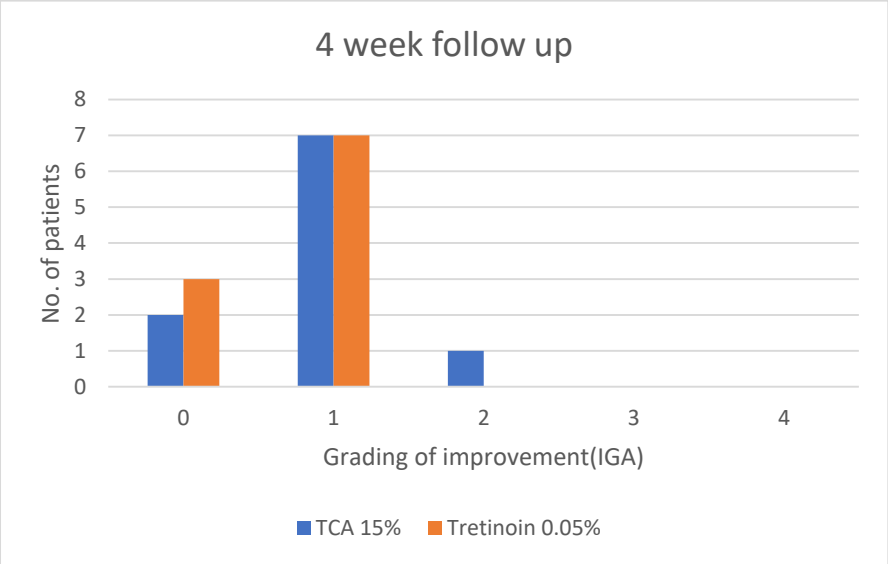

Figure 2- bar graph representing IGA grading at 4 weeks: 0-4(0=no improvement, 1= 0-25%, mild improvement, 2= 26 – 50%, moderate improvement, 3= 51-75%, marked improvement, 4= >76%, excellent improvement) and number of patients

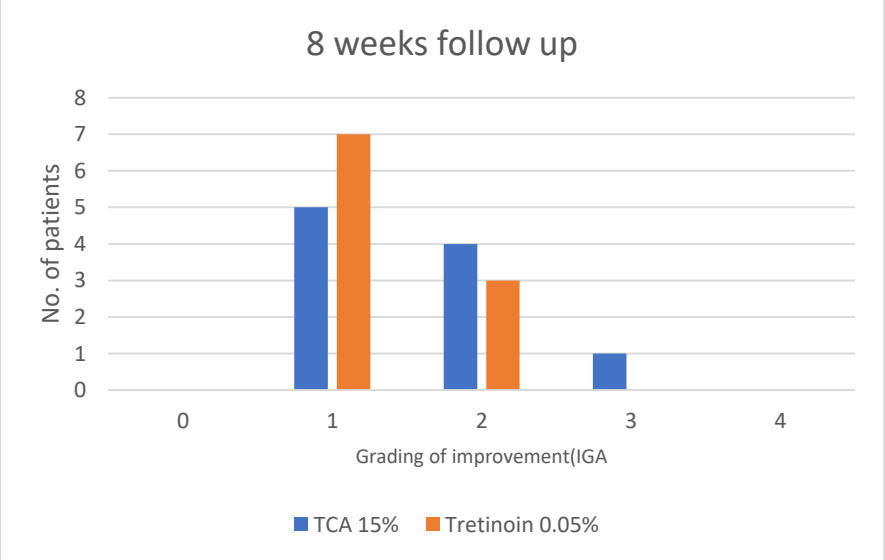

Figure 3- bar graph representing IGA grading at 8 weeks: 0-4(0=no improvement, 1= 0-25%, mild improvement, 2= 26 – 50%, moderate improvement, 3= 51-75%, marked improvement, 4= >76%, excellent improvement) and number of patients

Clinical Photographs

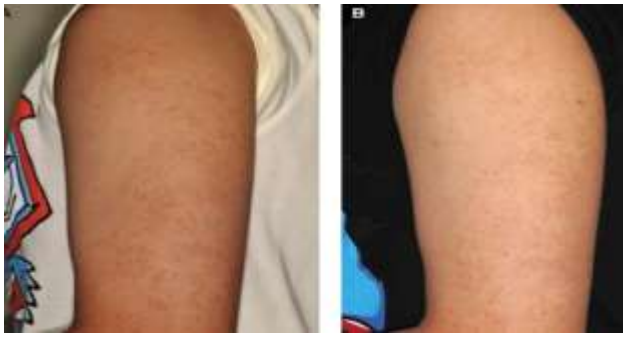

Figure 1: Showing before and after 8 weeks of treatment with TCA 15% chemical peel.

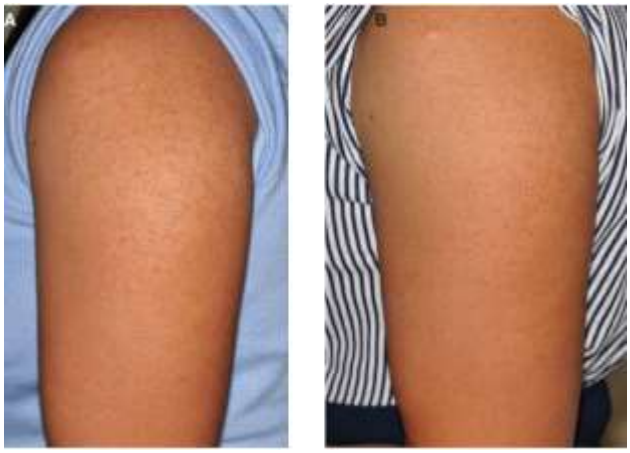

Figure 2: Showing before and after 8 weeks of treatment with Tretinoin 0.05% cream

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