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Original Research

Topical Aloe Vera in Treatment of Tinea Corporis or Cruris: An Open Therapeutic Clinical Trial

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Abstract:

Background: Superficial dermatophytosis of the glabrous skin (Tinea corporis or cruris) is a common condition in Iraq [1, 2]. While various effective treatment options exist, the readily available and inexpensive Aloe Vera plant, known for its antimicrobial properties, offers a potential alternative [3, 4].

Objective: This study aimed to evaluate the efficacy of Aloe Vera 5% gel in treating patients with a clinical diagnosis of tinea corporis or cruris in the, outpatient clinics in Mosul city during the period from (January to March 2023).

Materials and Methods: This open-label therapeutic trial enrolled volunteers of 21 patients (14 males and 7 females) with a clinical diagnosis of tinea corporis or cruris with clinically and laboratory-confirmed Tinea of the glabrous skin. Their ages ranged from 12 to 63 years, with a mean ± SD of 27.85 ± 12.35 years. The duration of the disease ranged from 1 to 12 weeks, with a mean ± SD of 5.95 ± 3.95 weeks.

Results: Mycological cure rates were observed from the first week of treatment with Aloe Vera 5% gel until the last week. Clinical response, assessed by the global clinical evaluation of improvement, showed considerable residual lesions (<50% clinical improvement) in the first week and marked improvement (> 50% clinical improvement) in the second, third, and fourth weeks. No adverse effects were reported.

Conclusion: Aloe Vera 5% gel demonstrated anti-inflammatory properties, reducing pruritus and scaling. However, antifungal activity may require a longer duration or increased concentration of active ingredients.

Key wards: Topical Aloe Vera, Tinea corporis, cruris, Clinical Trial

Introduction:

Superficial dermatophytosis, commonly known as tinea corporis or tinea cruris, is a prevalent skin condition globally, affecting individuals of all ages [1, 2, 4]. It is characterized by inflammatory and non-inflammatory lesions caused by dermatophytes, fungi that thrive on keratinized tissues like skin, hair, and nails [1, 2, 3, 4].

The most common dermatophytes responsible for these infections are Trichophyton rubrum, Trichophyton mentagrophytes, and Microsporum canis [3]. While various effective antifungal treatments are available, the search for safe and cost-effective alternatives remains ongoing.

Aloe Vera, a succulent plant with a long history in traditional medicine, holds promise as a potential alternative therapy [5, 6, 7]. Its gel, extracted from the leaves, possesses diverse pharmacological activities, including antimicrobial, anti-inflammatory, and wound-healing properties [6, 7, 8, 9, 10, 11].

Previous studies have suggested its efficacy in treating various skin conditions, including burns, wounds, and radiation-induced skin changes [8, 9, 10, 11]. However, further research is needed to confirm its effectiveness in specific dermatological conditions, particularly superficial dermatophytosis.

This study aimed to evaluate the efficacy of Aloe Vera 5% gel in treating patients with a clinical diagnosis of tinea corporis or cruris, confirmed by direct microscopical examination, in the outpatient clinics in Mosul city during the period from January to March 2023.

Materials and Methods:

Study Setting: The study was conducted in the outpatient clinics in Mosul city, from January to March 2023.

Study Participants: This open-label therapeutic trial enrolled volunteers of 21 patients (14 males and 7 females) diagnosed with tinea corporis or cruris, confirmed clinically and mycologically. Participants ranged in age from 12 to 63 years (mean ± SD: 27.85 ± 12.35 years). The duration of the disease ranged from 1 to 12 weeks (mean ± SD: 5.95 ± 3.95 weeks).

Treatment and Assessment: Patients received topical application of Aloe Vera 5% gel, prepared at the College of Pharmacy, three times daily for four weeks. Weekly assessments were conducted to monitor clinical improvement and mycological cure.

Clinical assessments included:

- **Physical Examination:** Thorough physical examinations were conducted weekly to assess target signs and symptoms, including itching, scaling, erythema, border activity, and lesion size.
- **Mycological Assessment:** Mycological assessment was performed weekly using scraping and KOH examination.

Results

Mycological Cure:

- All 21 patients exhibited positive KOH results at baseline.
- A gradual increase in mycological cure rate was observed over four weeks:
  - 14.3% of patients achieved negative KOH results by the first week.
  - 19.1% by the second week.
  - 38.1% by the third week.
  - 52.4% by the fourth week.
- Patients with negative KOH results at week 1 remained negative throughout the study.

Clinical Response:

- All 21 patients reported complete resolution of itching from the first week onwards.
- Scaling disappeared completely in all patients by the second week of treatment.
- Border activity began to disappear in 5 patients by the second week and reached 7 patients by the third week, remaining unchanged thereafter.
- Erythema and size remained unchanged throughout the study.

Global Clinical Evaluation:

- The global clinical evaluation showed considerable residual lesion (<50% clinical improvement) in the first week.
- Marked improvement (> 50% clinical improvement) was observed in the second, third, and fourth weeks of treatment.

Safety: No adverse effects were reported throughout the study.

Conclusion:

This study demonstrated the efficacy of topical Aloe Vera 5% gel in treating tinea cruris and corporis, evidenced by significant mycological cure rates and notable clinical improvement within four weeks. The treatment was well-tolerated, with no reported adverse effects. These findings support topical Aloe Vera gel as a safe and effective option for managing tinea cruris and corporis.

Table (1): Laboratory follow up of the 21 patients with positive KOH examination at baseline.

	No. of patients with +ve KOH	No. of patients with –ve KOH	% of Cure
Baseline	**21**	**0**	**----------**
1st week	**18**	**3**	**14.3%**
2nd week	**17**	**4**	**19.1%**
3rd week	**13**	**8**	**38.1%**
4th week	**10**	**11**	**52.4%**

Table (2): No. of patients with clinical improvement of target symptom and signs in all 21 patients

	Baseline	1st week	2nd week	3rd week	4th week
Itching	**+ve**	**21**	**21**	**21**	**21**
Scale	**+ve**	**6**	**21**	**21**	**21**
Erythema	**+ve**	**NC***	**NC**	**NC**	**NC**
Border activity	**+ve**	**NC**	**5**	**7**	**7**
Size	**-**	**NC**	**NC**	**NC**	**NC**

NC: no change

Table (3): Global clinical evaluation of improvement of all 21 patients

	1st week	2nd week	3rd week	4th week

Itching	**100%**	**100%**	**100%**	**100%**
Scale	**28.6**	**100%**	**100%**	**100%**
Erythema	**0%**	**0%**	**0%**	**0%**
Border activity	**0%**	**23.8%**	**33.4%**	**33.4%**
Size	**0%**	**0%**	**0%**	**0%**
Improvement	**<50%**	**≥50%**	**≥50%**	**≥50%**

Discussion:

Tinea of the glabrous skin is a superficial dermatophyte infection of the skin of the trunk and extremities characterized by inflammatory and non-inflammatory lesions [13]. Dermatophytes preferentially inhabit the non-living, cornified layers of the skin, the hair, and the nails, and they generally do not invade below the surface of the epidermis or its appendages.

Although it is eliminated by a cell-mediated immune reaction, penetration into the dermis and blood stream is prevented by non-specific host defense mechanisms, which include the effect of serum inhibitory factor and complement activation. Keratinases and other enzymes released by dermatophytes make it possible for the fungi to invade deeper in the stratum corneum and the skin response manifested by increased proliferation, which eventually lead to scaling and epidermal thickening [14].

Because dermatophytes rarely invade living tissues in tinea of glabrous skin, topical therapy is recommended for localized cases. Topical therapy should be applied to an area at least 2 cm beyond the edge of the identified lesion twice daily for at least 2 weeks, depending on which agent is used. Topical azoles and allylamines show high rates of clinical efficacy [15].

The aloe plant has been valued since prehistoric times for the treatment of so many skin diseases including infections, wound infections, burns, and other skin problems. The most uses of aloe (Aloe Vera) refer to the gel inside its leaves [16]. Test tube and animal studies suggest that it may stimulate immunity and inhibit growth of microorganisms [17, 18].

In order to translate these preliminary researches into actual benefits in human beings, the present study was conducted by using topical aloe in the treatment of tinea of glabrous skin (T. corporis, T. cruris), and the results were rewarding.

In the current study: After the 1st week of application of Aloe Vera 5% gel on lesions of tinea of glabrous skin, there is a marked decrease in the itching which also continues throughout the 2nd, 3rd, and 4th weeks of treatment. This might lead us to think that the topical Aloe Vera 5% gel has antipruritic activity.

Also, there is a slight decrease in the scaleness of the lesions after the 1st week of the treatment and there is no scale in the 2nd, 3rd, and 4th weeks of applications which might prove its anti-inflammatory activity and it might have a keratolytic effect.

The decrease in the scaleness of the lesions and the slight decrease in the border activity proved the effectiveness of the drug in stopping the disease activity, and this result is supported by the fact that the size of the lesions remains stationary, i.e. there is no increase in the size of the lesion, which is a marker of the disease activity.

From the laboratory finding of KOH examination, we saw the decrease in the positivity from the

baseline 100% positive until the 4th week 47.5%. So, we can conclude that the Aloe Vera 5% gel is effective in the treatment of tinea of glabrous skin and it's devoid of any side effects.

The observed clinical improvement, particularly the reduction in itching and scaling, could be attributed to the anti-inflammatory properties of Aloe Vera gel [20, 21]. It has been suggested that Aloe Vera gel possesses immunomodulatory effects, potentially contributing to the observed mycological cure [22].

However, further investigation is necessary to fully understand the mechanisms responsible for the observed antifungal activity. While this study demonstrates the potential of Aloe Vera 5% gel in treating tinea corporis and cruris, its efficacy as a primary antifungal agent may be limited. It is plausible that a longer duration of treatment or increased concentrations of active ingredients may be required for complete mycological eradication [19].

Additional research, exploring these factors, is crucial to further evaluate the potential of Aloe Vera as a therapeutic agent for superficial dermatophytosis. The safety profile of Aloe Vera gel, as demonstrated in this study, further supports its potential as a viable treatment option [28].

However, it is essential to consider potential adverse effects reported in previous studies [29, 30].

A thorough understanding of Aloe Vera's potential toxicity, coupled with appropriate monitoring and patient education, is crucial to ensure its safe and effective application.

Further research is warranted to investigate the optimal formulation, concentration, and duration of Aloe Vera gel treatment for tinea corporis and cruris. Additionally, exploring its synergistic effects when combined with other antifungal agents could lead to more comprehensive and effective treatment strategies.

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