



Asian Journal of Clinical Nutrition

ISSN 1992-1470

science
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***Aloe vera* Juice and Acne Vulgaris: A Placebo-Controlled Study**

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ABSTRACT

Lately, it has been shown that topical *Aloe vera* extract is effective against acne lesions. The objective of this study was to investigate the effectiveness of oral *Aloe vera* juice in a group of patients with mild-to-moderate acne vulgaris. In this double-blind, placebo-controlled, randomized clinical trial, 40 volunteers with mild-to moderate acne vulgaris were randomized equally into two, age and sex-matched groups, receiving either 50 cc of freshly prepared *Aloe vera* (*Aloe barbadensis* Miller) juice or placebo once daily for 30 consecutive days. Facial acne noninflamed, inflamed and total (noninflamed plus inflamed) lesion counts were documented at baseline on week 2 and at endpoint (day 30) by an observer who was blind to the grouping of patients. There were 12 males (60%) and 8 females (40%) with a mean age of 17.5±5.1 years (range: 12-27) in the case group and 10 males (20%) and 10 females (20%) with a mean age of 17.4±5.6 years (range: 12-29) in the control group ($p = 0.53$ and 0.98 , respectively). Although, the mean number of inflamed and total acne lesions decreased from baseline to the endpoint in the case group, these changes were not statistically different from those documented in the control group ($p = 0.96$ and 0.91 , respectively). In conclusion, oral *Aloe vera* juice may be helpful in decreasing noninflamed and total facial acne lesion counts in patients with mild-to-moderate acne vulgaris, this beneficial effect is not significant when compared to controls.

Key words: Acne vulgaris, *Aloe vera*, facial lesion

INTRODUCTION

Even in the current era of modern medicine, there is a widespread enthusiasm toward botanical agents and natural remedies for treating maladies. Presence of numerous ongoing researches to find better compounds in this regard is a good indicator of this inclination (Saeedi *et al.*, 2003; Kanlayavattanakul and Lourith, 2011).

Acne vulgaris is among the most common and bothersome diseases that may interfere with normal life of adolescents and young adults (Admani and Barrio, 2013). Although, many effective therapies are available (Babaeinejad *et al.*, 2011; Khodaeiani *et al.*, 2012, 2013; Babaeinejad and Fouladi, 2013; Fouladi, 2013), many are accompanied with serious complications and side effects which may cause patients to discontinue their medications (Navali *et al.*, 2011).

Aloe vera, a perennial succulent xerophyte (Hamman, 2008), has been used as a therapeutic agent in several cultures for many years (Reynolds and Dweck, 1999; Vogler and Enst, 1999; Fattahi *et al.*, 2011). Over 75 active ingredients have been identified from *Aloe vera* leaf extract (Habeeb *et al.*, 2007a).

Due to its important pharmacological actions such as anti-inflammation, anti-irritation and anti-bacterial effects (Chithra *et al.*, 1998; Reynolds and Dweck, 1999; Vogler and Enst, 1999; Habeeb *et al.*, 2007b), *Aloe vera* has been suggested as a potential remedy in acne vulgaris. For example, in a recent study, a combination of topical retinoid and *Aloe vera* topical gel was more effective than retinoids alone against acne lesions (Hajheydari *et al.*, 2014).

This study, for the first time in the literature, aimed to investigate the effect of oral *Aloe vera* juice alone in treating patients with mild-to-moderate acne vulgaris.

MATERIALS AND METHODS

This study was a double-blind, placebo-controlled, randomized clinical trial, recruiting 40 volunteers with moderate-to-severe acne vulgaris (Burke and Cunliffe, 1984) from a private clinic from April 2013-March 2014.

Secondary acne cases, patients with hypersensitivity to *Aloe vera*, pregnant women, patients with other simultaneous dermatologic diseases and those on known anti-acne treatments started from the previous 3 months were excluded.

Aloe vera (*Aloe barbadensis* Miller) juice was prepared from freshly obtained *Aloe vera* leaves from the local market following a previously published instruction (Nagpal *et al.*, 2012).

Patients were randomized in two patient groups, receiving either 50 cc of the prepared *Aloe vera* juice once daily (case group) or 50 cc distilled water mixed with *aloe vera* artificial flavor (control group) for 30 consecutive days.

The preparations were physically similar and the two groups were labeled as "A" or "B" by a colleague who was not involved in this study.

Neither the patients nor the examiner were aware of the grouping until the study was completed.

Noninflamed, inflamed and total facial acne lesions were counted at baseline on week 2 and at the endpoint.

Within the study period, the patients were instructed to not use any anti-acne medication and all followed a conventional, similar diet.

All the patients in both groups completed this study.

Statistical analysis: Data analysis was performed using the SPSS software version 16.0 (SPSS Inc., IL, USA). Employed statistical tests were the Chi-square test, independent samples t tests and Repeated Measures Analysis (RMA). The values of $p \leq 0.05$ were considered as significant.

RESULTS

Patients who received *Aloe vera* juice were 12 males (60%) and 8 females (40%) with a mean age of 17.5 ± 5.1 years (range: 12-27). Their counterparts in the placebo group were 10 males (20%) and 10 females (20%) with a mean age of 17.4 ± 5.6 years (range: 12-29). The two groups were comparable for sex and age ($p = 0.53$ and 0.98 , respectively). The mean duration of the disease was 3.5 ± 2.0 years (range: 1-7) in the case group and 3.4 ± 1.7 years (range: 1-6) in the control group ($p = 0.87$). The mean counts of acne lesions on the face of patients in the two groups are summarized in Table 1. The change in the mean number of noninflamed lesions from baseline to endpoint did not differ significantly between the two groups ($p = 0.81$). Similar findings were documented for the changes in the mean number of inflamed ($p = 0.96$) and total acne lesions ($p = 0.91$). No important complications were present in the case group.

Table 1: Mean facial acne lesions at baseline on week 2 and at endpoint in two groups receiving either *Aloe vera* juice (cases) or placebo (controls)

Lesion/time	Case (n = 20)		Control (n = 20)	
	Mean	Range	Mean	Range
Noninflamed				
Baseline	20.1±4.6	14-29	20.8±4.4	14-29
Week 2	19.9±5.0	12-28	19.4±4.0	14-27
Endpoint	20.0±5.6	10-27	20.8±3.4	15-27
Inflamed				
Baseline	25.0±3.9	21-36	23.1±5.2	17-36
Week 2	22.8±5.0	16-36	23.5±4.6	19-36
Endpoint	22.2±6.0	14-36	23.1±4.8	18-36
Total				
Baseline	45.0±7.1	36-65	43.9±7.8	33-63
Week 2	42.7±8.3	30-62	42.9±6.2	36-61
Endpoint	42.2±9.7	25-61	43.9±6.8	32-61

Data is presented as Mean±Standard deviation

DISCUSSION

In the present study, although oral *Aloe vera* juice alone was effective in diminishing inflamed and total facial acne lesions in patients with mild-to-moderate acne vulgaris, this effect was not statistically significant.

To the best of the authors' knowledge, this is the first study in the literature that examines therapeutic effect of oral *Aloe vera* juice alone in patients with acne vulgaris.

In a similar study, Hajheydari *et al.* (2014) examined the therapeutic effect of a topical combination of retinoid cream and *Aloe vera* topical gel (50%) in 60 patients with mild-to-moderate acne vulgaris. They finally concluded that this combination was more effective than the cream alone in decreasing acne lesions.

In contrast to this study, our findings in terms of the efficacy of *Aloe vera* alone were not statistically significant because we used oral route of administration instead of topical application of *Aloe vera* extract.

In another series, Lalla *et al.* (2001) used an ayurvedic formulation containing *Aloe vera* gel and six other herbal preparations topically in patients with acne vulgaris and found it effective in decreasing the count of acne lesions.

They also used a topical preparation instead of an oral compound and in contrast to our study, they used *Aloe vera* gel in combination with other herbal extract.

Aloe vera has shown anti-inflammatory, anti-irritant, anti-bacterial, immunomodulatory, anti-oxidant, skin hydration and wound healing effects (Fulton, 1990; Vogler and Enst, 1999; Jain and Basal, 2003; Habeeb *et al.*, 2007b; Hamman, 2008; Amirnia *et al.*, 2012; Baharivand *et al.*, 2013).

All these specifications are shared with a typical efficient anti-acne medication (Fouladi, 2012). *In vitro* study by Lawrence *et al.* (2009) showed that an ayurvedic formulation containing *Aloe vera* demonstrated anti-bacterial activity against *Propionibacterium acne*, the main bacterium playing pivotal role in the pathogenesis of acne vulgaris.

Similar anti-bacterial effect of *Aloe vera* against *Propionibacterium acne* was also demonstrated in another study by Jain and Basal (2003), possibly through inhibiting inflammatory agents such as prostaglandin and platelet activating factor-induced exocytosis (Tunon *et al.*, 1995).

These findings may explain why the therapeutic effect of *Aloe vera* juice was more prominent for inflamed acne lesions when compared to noninflamed lesions.

A skin-soothing property of *Aloe vera* (Chularojanamontri *et al.*, 2014), on the other hand, may justified our findings in term of total acne lesions.

Overall, this study showed that although oral *Aloe vera* juice alone may be helpful in decreasing inflamed and total acne lesions, its efficacy does not reach a statistically significant level.

It has been shown that *Aloe vera* extract can improve the bioavailability of co-administered medications in human subjects (Vinson *et al.*, 2005). So, concomitant administration of *Aloe vera* juice and other conventional anti-acne medications may be the subject of future studies in this regard (Shakeri *et al.*, 2011a, b; Feiz *et al.*, 2012; Tarzamni *et al.*, 2012; Pouriesa *et al.*, 2013; Daghighi *et al.*, 2014; Sabeti *et al.*, 2013).

CONCLUSION

Oral *Aloe vera* juice may be helpful in decreasing noninflamed and total facial acne lesion counts in patients with mild-to-moderate acne vulgaris. This beneficial effect is not significant when compared to controls.

REFERENCES

- Admani, S. and V.R. Barrio, 2013. Evaluation and treatment of acne from infancy to preadolescence. *Dermatol. Ther.*, 26: 462-466.
- Amirnia, M., E. Khodaeiani, R.F. Fouladi and A. Hashemi, 2012. Topical steroids versus PUVA therapy in moderate plaque psoriasis: A clinical trial along with cost analysis. *J. Dermatol. Treat.*, 23: 109-111.
- Babaeinejad, S., E. Khodaeiani and R.F. Fouladi, 2011. Comparison of therapeutic effects of oral doxycycline and azithromycin in patients with moderate acne vulgaris: What is the role of age? *J. Dermatol. Treat.*, 22: 206-210.
- Babaeinejad, S.H. and R.F. Fouladi, 2013. The efficacy, safety and tolerability of adapalene versus benzoyl peroxide in the treatment of mild acne vulgaris: A randomized trial. *J. Drugs Dermatol.*, 12: 1033-1038.
- Baharivand, N., A. Mahdavifard and R.F. Fouladi, 2013. Intravitreal clindamycin plus dexamethasone versus classic oral therapy in toxoplasmic retinochoroiditis: A prospective randomized clinical trial. *Int. Ophthalmol.*, 33: 39-46.
- Burke, B.M. and W.J. Cunliffe, 1984. The assessment of acne vulgaris-the leeds technique. *Br. J. Dermatol.*, 111: 83-92.
- Chithra, P., G.B. Sajithlal and G. Chandrakasan, 1998. Influence of Aloe Vera on the healing of dermal wounds in diabetic rats. *J. Ethnopharmacol.*, 59: 195-201.
- Chularojanamontri, L., P. Tuchinda, K. Kulthanan and K. Pongparit, 2014. Moisturizers for acne. What are their constituents? *J. Clin. Aesthet. Dermatol.*, 7: 36-44.
- Daghighi, M.H., M. Pouriesa, M. Maleki, D.F. Fouladi, M.Z. Pezeshki, R.M. Khameneh and A.M. Bazzazi, 2014. Migration patterns of herniated disc fragments: A study on 1,020 patients with extruded lumbar disc herniation. *Spine J.*, 14: 1970-1977.
- Fattahi, E., M.H. Somi, M.R. Moosapour and R.F. Fouladi, 2011. Independent predictors of in-hospital re-bleeding, need of operation and mortality in acute upper gastrointestinal bleeding. *Pak. J. Biol. Sci.*, 14: 849-853.

- Feiz, H.H., A. Afrasiabi, R. Parvizi, A. Safarpour and R.F. Fouladi, 2012. Scoliosis after thoracotomy/sternotomy in children with congenital heart disease. *Indian J. Orthop.*, 46: 77-80.
- Fouladi, R.F., 2012. Aqueous extract of dried fruit of *Berberis vulgaris* L. in acne vulgaris, a clinical trial. *J. Diet. Suppl.*, 9: 253-261.
- Fouladi, R.F., 2013. A single case report using an antiacne topical medication for severe foot odor. *JAMA Dermatol.*, 149: 250-251.
- Fulton, J.E., Jr., 1990. The stimulation of postdermabrasion wound healing with stabilized aloe vera gel-polyethylene oxide dressing. *J. Dermatol. Surg. Oncol.*, 16: 460-467.
- Habeeb, F., E. Shakir, F. Bradbury, P. Cameron and M.R. Taravati *et al.*, 2007a. Screening methods used to determine the anti-microbial properties of Aloe vera inner gel. *Methods*, 42: 315-320.
- Habeeb, F., G. Stables, F. Bradbury, S. Nong, P. Ameron, R. Plevin and V.A. Ferro, 2007b. The inner gel component of Aloe vera suppresses bacterial-induced pro-inflammatory cytokines from human immune cells. *Methods*, 42: 388-393.
- Hajheydari, Z., M. Saeedi, K. Morteza-Semnani and A. Soltani, 2014. Effect of *Aloe vera* topical gel combined with tretinoin in treatment of mild and moderate acne vulgaris: A randomized, double-blind, prospective trial. *J. Dermatol. Treat.*, 25: 123-129.
- Hamman, J.H., 2008. Composition and applications of Aloe vera leaf gel. *Molecules*, 13: 1599-1616.
- Jain, A. and E. Basal, 2003. Inhibition of Propionibacterium acnes-induced mediators of inflammation by Indian herbs. *Phytomedicine*, 10: 34-38.
- Kanlayavattanukul, M. and N. Lourith, 2011. Therapeutic agents and herbs in topical application for acne treatment. *Int. J. Cosmet. Sci.*, 33: 289-297.
- Khodaeiani, E., R.F. Fouladi, N. Yousefi, M. Amirnia, S. Babaeinejad and J. Shokri, 2012. Efficacy of 2% metronidazole gel in moderate acne vulgaris. *Indian J. Dermatol.*, 57: 279-281.
- Khodaeiani, E., R.F. Fouladi, M. Amirnia, M. Saeidi and E.R. Karimi, 2013. Topical 4% nicotinamide vs. 1% clindamycin in moderate inflammatory acne vulgaris. *Int. J. Dermatol.*, 52: 999-1004.
- Lalla, J.K., S.Y. Nandedkar, M.H. Paranjape and N.B. Talreja, 2001. Clinical trials of ayurvedic formulations in the treatment of acne vulgaris. *J. Ethnopharmacol.*, 78: 99-102.
- Lawrence, R., P. Tripathi and E. Jeyakumar, 2009. Isolation, purification and evaluation of antibacterial agents from *Aloe vera*. *Brazil. J. Microbiol.*, 40: 906-915.
- Nagpal, R., V. Kaur, M. Kumar and F. Marotta, 2012. Effect of *Aloe vera* juice on growth and activities of *Lactobacilli in-vitro*. *Acta Biomedica*, 83: 183-188.
- Navali, N., S. Pourabolghasem, R.F. Fouladi and M.A. Nikpour, 2011. Therapeutic effects of biguanide vs. statin in polycystic ovary syndrome: A randomized clinical trial. *Pak. J. Biol. Sci.*, 14: 658-663.
- Pouriesa, M., R.F. Fouladi and S. Mesbahi, 2013. Disproportion of end plates and the lumbar intervertebral disc herniation. *Spine J.*, 13: 402-407.
- Reynolds, T. and A.C. Dweck, 1999. *Aloe vera* leaf gel: A review update. *J. Ethnopharmacol.*, 68: 3-37.
- Sabeti, S., F. Malekzad, M. Ashayer, R.F. Fouladi, K.K. Hesari, M.P. Toutkaboni and S. Younespour, 2013. The rate and pattern of bcl-2 and cytokeratin 15 expression in trichoepithelioma and nodular basal cell carcinoma: A comparative study. *Indian J. Dermatol.*, 58: 331-336.
- Saeedi, M., K. Morteza-Semnani and M.R. Ghoreishi, 2003. The treatment of atopic dermatitis with licorice gel. *J. Dermatol. Treat.*, 14: 153-157.

- Shakeri, A., M. Abdi, H.T. Khosroshahi and R.F. Fouladi, 2011a. Common carotid artery intima-media thickness and atherosclerotic plaques in carotid bulb in patients with chronic kidney disease on hemodialysis: A case-control study. *Pak. J. Biol. Sci.*, 14: 844-848.
- Shakeri, A., M.B. Bazzaz, A. Khabbazi and R.F. Fouladi, 2011b. Common carotid intima-media thickness in patients with late rheumatoid arthritis: What is the role of gender? *Pak. J. Biol. Sci.*, 14: 812-816.
- Tarzamni, M.K., N. Eshraghi, R.F. Fouladi, A. Afrasiabi, M. Halimi and A. Azarvan, 2012. Atherosclerotic changes in common carotid artery, common femoral artery and ascending aorta/aortic arch in candidates for coronary artery bypass graft surgery. *Angiology*, 63: 622-629.
- Tunon, H., C. Olavsdotter and L. Bohlin, 1995. Evaluation of anti-inflammatory activity of some Swedish medicinal plants. Inhibition of prostaglandin biosynthesis and PAF-induced exocytosis. *J. Ethnopharmacol.*, 48: 61-76.
- Vinson, J.A., H. Al Kharrat and L. Andreoli, 2005. Effect of *Aloe vera* preparations on the human bioavailability of vitamins C and E. *Phytomedicine*, 12: 760-765.
- Vogler, B.K. and E. Enst, 1999. *Aloe vera* a systematic review of its clinical effectiveness. *Br. J. Gen. Practice*, 49: 823-828.