นิพนธ์ต้นฉบับ

Efficacy of Aloe vera leaves extract on the treatment of melasma

Wiwat Korkij*
Laddawan Bhunratanakornkij* Sutee Wakawakyanon*

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This study is designed to determine whether the aloe vera has any benificial effects in the treatment of melasma. Eightynine patients were recruited in this study. Most of them (86.5%) have the epidermal type and the rest have the mixed epidermal-dermal type of melasma. The patients were randomly designated to receive either the aloe vera cream or vehicle cream base in a double blind fashion. Each patient also used sunscreen cream in the morning. Forty-one patients completed 24 weeks follow up period. Twenty of them used aloe vera cream. We found that the intensity of melasma in aloe vera group was better staticall significantly ($p < 0.05$) than placebo group. After treatment, the area of melasma in both groups decreased statiscal significantly ($p < 0.05$) as compared to before treatment. The area of melasma also significantly decreased ($p < 0.05$) more in the aloe group than in placebo group. From this study, it is indicated that aloe vera cream is better than placebo in the treatment of melasma. The decreased intensity and areas of melasma in both groups may be due to the sunscreen that the patients in both groups used.

Key words: Melasma, Aloe vera, Pigmentary disorder.

Reprint request : Korkij W. Department of Internal Medicine, Faculty of Medicine Chulalongkorn University Bangkok 10330, Thailand.

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*Department of Internal Medicine, Faculty of Medicine, Chulalongkorn University.

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ฝ้าเป็นโรคที่พบได้บ่อยในประเทศไทย สาเหตุที่สำคัญคือ เกิดจากแสงแดด มียาหลายอย่างที่นำมารักษาฝ้า ส่วนใหญ่ทำให้เกิดผลข้างเคียงเป็นอันตรายแก่ใบหน้าได้ มีผู้นำเอาว่านหางจระเข้มารักษาฝ้าตั้งแต่สมัยโบราณ โดยผลที่ได้รับไม่แน่นอนนัก คณะวิจัยได้ทำการวิจัยขึ้นเพื่อพิสูจน์ว่าว่านหางจระเข้มีผลในการรักษาฝ้าจริงหรือไม่ โดยศึกษาในผู้ป่วยทั้งหมด 89 ราย เป็นฝ้าชนิด epidermal type 86.5% ที่เหลือเป็นชนิด Mixed epidermal-dermal type แบ่งผู้ป่วยออกเป็น 2 กลุ่ม โดยวิธีสุ่ม ผู้ป่วยกลุ่มหนึ่งได้รับยาฝ้าที่ทำจากวุ้นข้างในของใบว่านหางจระเข้ ผสมเป็นรูปครีม อีกกลุ่มหนึ่งได้ยาที่มีแต่เนื้อครีมเฉย ๆ (placebo) ทั้งผู้ป่วยและแพทย์ที่ทำการรักษาไม่ทราบว่าใครได้รับยาอะไร (Double blind study) ผู้ป่วยทุกคนได้รับยากันแดดทาตอนเช้าด้วย มีผู้ป่วยทั้งหมด 41 รายที่รักษาครบ 24 อาทิตย์ แบ่งเป็นผู้ป่วยที่ได้รับยาว่านหางจระเข้ 20 ราย และได้รับยา placebo 21 ราย คนไข้ที่ได้รับว่านหางจระเข้มีความเข้มของฝ้าจางลงมากกว่ากลุ่ม placebo อย่างมีนัยสำคัญ ($p < 0.05$) พื้นที่ฝ้าทั้งในกลุ่มได้ว่านหางจระเข้ และในกลุ่ม placebo หลังการรักษาดีขึ้นกว่าก่อนการรักษาอย่างมีนัยสำคัญ ($p < 0.05$) ทั้ง 2 กลุ่ม เมื่อเปรียบเทียบความแตกต่างของพื้นที่ฝ้าก่อนและหลังการรักษาของทั้ง 2 กลุ่ม พบว่ากลุ่มที่ได้ว่านหางจระเข้มีพื้นที่ฝ้าลดลงหลังการรักษามากกว่ากลุ่ม placebo อย่างมีนัยสำคัญ ($p < 0.05$) เช่นกัน จากการทดลองพบว่าว่านหางจระเข้ทำให้ฝ้าดีขึ้น เมื่อเทียบกับ placebo และที่ความเข้มและพื้นที่ของฝ้าดีขึ้นในทั้ง 2 กลุ่มนี้ อาจเนื่องมาจากผลของยากันแดดที่ผู้ป่วยทั้ง 2 กลุ่มได้รับ

Melasma is an acquired hypermelanosis which occurs in sun-exposed areas and is exacerbated by light.[1] Women are usually affected, but it is occasionally seen in males. Melasma may be idiopathic or associated with pregnancy, or ingestion of oral contraceptives.[2] Lesions are usually symmetrical and typically involve the forehead, cheeks, temples and upper lip. The macules are characteristically medium to dark brown and have discrete geographic borders. The pigmentation fades slowly following pregnancy or after cessation of oral contraceptives; however, it can persist for several years.

Aloe vera has been used widely since the ancient time by the lay people. It is an ingredient in a wide variety of cosmetic products, including night creams, soaps, shampoos, suntan lotions, and cleansers.[3] Many lay persons believe that aloe vera can be used to treat melasma by applying the fresh aloe leaf jelly over the lesion. However, side effects occur with this procedure, such as allergic contact dermatitis or irritant dermatitis.[4] The important ingredient in aloe leaf is anthraquinone glycerides which compose of many other substances, for example Aloin and Aloe emodin.[3] There are two main properties of aloin that effects the skin. Aloin can shield the skin by absorption of UV light[5] and also can inhibit the tyrosinase enzyme which is important in melanogenesis. Both properties seem beneficial in the treatment of melasma. This research is conducted to study the efficacy of aloe vera leaves extract on the treatment of melasma.

Meterials and Methods

A total of 89 patients with melasma, who attended the out patient dermatology clinic Chulalongkorn hospital, were recruited in this double blind study. The diagnosis of melasma was made by on clinical ground only. All previous melasma creams were stopped at least one month prior to entry into this study. The aloe cream and placebo (vehicle) cream were kindly prepared by the Faculty of Pharmacy Chulalongkorn University. The patients were randomly divided to use either the aloe cream or vehicle cream base. The patients of both groups complied with the following procedures.

1. Medical history of the lesion and aggravating factors.

2. Examination of the lesion under Wood's lamp to divide melasma into three groups:epidermal, mixed epidermal-dermal and dermal type.

3. Comparision in the color-intensity of affected areas to normal skin using the following grades

Grade 1. No difference

Grade 2. Slightly more intensive than normal skin.

Grade 3. Moderately more intensive than normal skin.

Grade 4. Markedly more intensive than normal skin.

Grade 5. Highly more intensive than normal skin.

4. Measurement of the areas of melasma involement by using clear plastic to outline the melasma areas and the whole face and then calculate the melasma areas as a percentage of total face area.

5. Photographs of melasma area were randomly taken in some patients before treatment and during the follow up period.

6. Each patient received the following medicaments.

- Aloe vera cream or placebo cream to be applied to the melasma area in the morning and at the bed time.
- PABA cream to be applied all over the face after aloe or placebo cream.
- Dermasoap (clear, no allergic soap) for washing the face when taking a bath.

7. Follow up at 4, 9, 14, 19 and 24 weeks, each time the patients were asked about side effect of the creams, the melasma areas were measured and the colour-intensity were noted.

Statistical methods

The comparison of melasma areas before and after treatment in both groups was examined with paired t-test. The comparison of colour intensity and melasma areas of both groups were examined with unpaired t-test.

Results

Eighty-nine patients entered this study. The male/female ratio was 1:29 (3:86); ages ranged from 21 to 59 years (mean age 37.18) and the duration of the lesion ranged from 3 months to 10 years (mean = 40 months). Seventy-seven patients (86.5%) had epidermal type of melasma, the rest had mixed type (13.5%). The melasma was initially noted at the time of pregnancy in 11 (12.35%) patients, during the use of oral contraceptives in 11 (12.35%) patients and when

used cosmatics in 2 (2.25%) patients. Seventy-four patients (83.15%) had a history of sunlight aggravating the intensity of melasma.

Of the 89 patients, only 41 patients completed the 24 weeks follow up period. In this group, 20 patients used aloe cream and 21 patients used placebo cream (table 1.).

Group using aloe cream (20 patients)

The Colour intensity of melasma decreased 2 grades in 3 patients, decreased 1 grade in 9 patients and there was no change in 8 patients after treatment (table 2). The mean areas of melasma before treatment was 16.6± 6.9%(range from 3.5%-27.6%) of total face area. After treatment, the melasma areas were decreased to 10.6 ±7.5 %(range from 1.4 %-26.6 %) of total face area (table 3). Only 2 patients in this group had increased in the melasma areas after treatment. From 16.7%to 26.6%of total face area in one patient and 14.5%to 17.8%of total face area in the other. When compared with before treatment, there is a statistical difference ($p < 0.05$). No side effects were noted in this group.

Table 1. Characteristic of patients.

	Aloe group (n = 20)	Placebo group (n = 21)
Age (yrs.) : × ± SD	41.5 ± 9.0	37.7 ± 7.9
Type of melasma(No)		
epidermal	15	17
mixed	5	4
Duration (mo.) : × ± SD of lesion	60.3 ± 44.5	59.2 ± 43.5

Table 2. Intensity of melasma.

Melasma intensity	Aloe group (n = 20)	Placebo group (n = 21)
decreased 2 grade	3	2
decreased 1 grade	9	9
no change	8	10
Increased 1 grade	–	–
Increased 2 grade	–	–

Table 3. Area of Melasma.

Area of Melasma (% of total face area)	Aloe group (n = 20)	Placebo group (n = 21)
Before treatment	16.6 ± 6.9	20.8 ± 8.8
After treatment	10.6 ± 7.5	18 ± 8

Group using placebo cream (21 patients)

The colour intensity of melasma decreased 2 grades in 2 patients, 1 grade in 9 patients and there were no change in 10 patients after treatment. The mean areas of melasma before treatment was 20.8 ± 8.8% (range from 8.5% to 39.6%) of total face area. After treatment, the melasma areas were decreased to 18 ± 8% (range from 7.8%-24.4%). When compared with before treatment, there is statistical difference ($p < 0.05$). Seven patients in this group had increased in the melasma areas after treatment. Mean increase in melasma areas were 3.4% (range from 6.2% to 5.3%) of total face area.

There was statistical difference ($p < 0.05$) in the decrease of colour intensity and melasma areas in aloe vera group when compared with placebo group.

Discussion

There are more than 300 species of aloe that is currently used by the Pharmaceutical and cosmetic industries. Aloe barbadensis (Miller) or Aloe vera linne, Aloe ferrox (Miller) and aloe perryi (Baker) are most commonly used.[3] In Thailand, Aloe vera linne is the most commonly found. Aloe vera leaf is the importance part. It is composed of 2 parts : skin and aloe jelly.

- The major cells of the skin part are pericyclic cells which produce latex yellowish juice. Latex contains aloe emodin, an anthraquinone that absorbs UV light.

- Aloe jelly is obtained from thin-walled mucilaginous cells of the inner central zone of the leaf. The main component is mucopolysaccharides such as Aloctin A, Aloctin B (Lectin P-Z, Lectin S-1). It also contains a variety of organic materials and enzymes thought to contribute to the purported emollient, moisturizing and healing effects of the gel.[6] Emodin and Aloin in gel can be broken down by Kolve reaction to form salicylates.[6] Salicylates are both analgesic and anti-inflammatory, inhibiting the production of prostaglandins from arachidonic acid by inhibiting cyclooxygenase.[7]

Aloe vera extract was found to be bactericidal against Pseudomonas aeruginosa, Klebsiella pneumoniae, Seratia marcescens, Citrabacter species, Enterobactor cloacae, S. pyogenes and Streptococcus agalactiae.[6] Aloe has been used to treat many skin diseases such as burn wound[8], scalded skin, infected wound, radiation dermatitis[9], allergic skin disease, acne and melasma.

From this study, we found that the intensity of melasma decreased in 60% of the patients treated with aloe cream at the end of 24 weeks as compared with 52% of the placebo group. The mean decrease of melasma areas was 10.6 ± 7% of total face area in aloe vera group as compared with 18 ± 8% of placebo group. The aloe vera group is better statistically significant than placebo group by both parameters. No one in either groups had completely cleared melasma. Because of this reason together with the long duration for before clinical improvement is seen, half of the patients (53.3%) were lost to follow up. We had analysed the datas of these lost to follow up patients. There was also a trend that patients in the aloe vera group were better than in the placebo group. We do not think that there will be any effects on the final results. Because sunlight is the important aggravating factor, the decreased intensity and area of melasma in both groups may be due to sunscreen that the patients in both groups used.

Conclusion

We treated 41 melasma patients with either Aloe cream or placebo for 24 weeks in a double blind fashion. We found that the patients who used Aloe cream had statistically significant results than placebo group. However, the improvement of melasma in both groups is probably due to the sunscreen they used.

References

1. Sanchez NP, Pathak MA, Sato S, Fitzpatrick TB, Sanchez JL. Mihn MC Jr. Melasma : a clinical, light microscopic, ultrastructural and immunofluorescence study. J Am Acad Dermatol 1981 Jun; 4(6) : 698-710
2. Smith AG, Shuster S, Thody AJ, Peberdy M. Chloasma, oral contraceptives, and plasma immunoreactive beta-melanocyte-stimulating hormone. J Invest Dermatol 1977 Apr; 68(4): 169-70
3. Klein AD, Penneys NS. Aloe vera. J Am Acad Dermatol 1988 Apr; 18(4pt 1) : 714-20
4. Morrow DM, Rapaport MS, Strick RA. Hypersensitivity to aloe. Arch Dermatol 1980 Sep; 116(9) : 1064-5
5. Bader S, Carinelli L, Cozzi R, Cozzoli O. Natural hydroxyanthracenic polyglycosides as sunscreens. Cosmet Toiletries 1981; 961(1) : 67-74

6. Robron MC, Heggers JP, Hagstrom WJ. Myth, magic, witchcraft, or fact. Aloe vera revisited J Burn Care Rehab 1982; 3 : 157-62
7. Penneys NS. Inhibition of arachidonic acid oxidation in vitro by vehicle components. Acta Derm Venereol (Stockh) 1981; 62(1) : 59-61
8. Zawahry ME, Hegazy MR, Helal M. Use of aloe in treating leg ulcers and dermatoses. Int J Dermatol 1973 Jan-Feb; 12(1) : 68-73
9. Loveman AB. Leaf of aloe vera in treatment of roentgen ray ulcers. Arch Dermatol Syph 1973; 36 : 838-43