

Clinical Trial of *Aloe vera* Linn. for Treatment of Minor Burns

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Abstract : A randomized controlled trial to assess the efficacy of *Aloe vera* Linn. for the topical treatment of minor burns was conducted in 38 patients admitted to two community hospitals. Twenty patients were treated with fresh mucilage prepared from *Aloe vera* Linn. and 18 were treated with sulfadiazine. The baseline characteristics of the patients in both groups were not significantly different. The success rates were observed in 95 and 83 per cent of the patients in the *Aloe vera* Linn. group and the silver sulfadiazine group, respectively. About one third of the patients in both groups experienced irritation at the sites of topical treatment.

เรื่องย่อ : ประสิทธิภาพของว่านหางจระเข้ในการรักษาแผลไฟไหม้น้ำร้อนลวก.

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ได้ศึกษาประสิทธิภาพของการใช้เยื่อเมือกของว่านหางจระเข้สำหรับรักษาแผลไฟไหม้น้ำร้อนลวกเปรียบเทียบกับ silver sulfadiazine ในผู้ป่วย ๓๘ ราย, พบว่า การรักษาทั้งสองวิธีนี้มีประสิทธิภาพดี และปลอดภัย ไม่แตกต่างกัน.

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Aloe vera Linn. is a medicinal plant easily grown throughout Thailand. Its leaves contain glycoproteins identified as aloctin A or Lectin P-2 which possess healing and anti-inflammatory properties.¹ Open clinical trials observed that fresh mucilage, creams or gels prepared from *Aloe vera* Linn. leaves were effective in treating radiation burns,^{2,3} chronic ulcers,^{4,5} viral and fungal skin infections³ and thermal burns.^{5,7} Acute toxicity study of *Aloe vera* Linn. mucilage on rabbit skin showed no reaction for up to 76 hours following application.⁵

The objective of the study was to test the efficacy of fresh mucilage of *Aloe vera* Linn for the topical treatment of burns compared with silver sulfadiazine.

PATIENTS AND METHODS

A multicenter study of the two preparations for treating burns was conducted in Tung-Song and Phon Hospitals in 1988. Patients of any age were included in the study if they had thermal first or second-degree burns over an area of less than 30 percent of the body surface area (BSA) within 24 hours of admission and had not yet received any antibiotics or topical treatment. Patients with diabetes mellitus or those in a moribund state were excluded. Eligible patients were designated to receive *Aloe vera* Linn. mucilage or silver sulfadiazine for topical treatment of their burns by stratified randomization selection based on two prognostic factors, namely the depth and the size of the lesions. The topical medications were

Table 1. Baseline characteristics of the patients receiving treatment with *Aloe vera* Linn. mucilage and silver sulfadiazine.

Characteristics*	<i>Aloe vera</i> mucilage group (n = 20)	silver sulfadiazine group (n = 18)
Male:female	11:9	11:7
Mean age (years)	18	25.2
Age range (years)	0.3-46	0.2-62
Type of burn		
Thermal	18	17
Electrical	2	1
Median symptom (hours)	<1	<1
Mean extent of lesions (% of body surface area)	8	11.1
Depth of the lesions		
First degree	9	5
Second degree	11	13
Concomitant treatment (%)		
Intravenous fluid	6 (30%)	6 (33%)
Antibiotics	12 (60%)	12 (67%)
Analgesics	13 (65%)	13 (72%)
Tetanus prophylaxis	2	1
Sedatives	2	2
Other	2	-
None	4 (20%)	1 (6%)
Mean duration (days) of topical treatment (range)	7.5 (3-26)	6.8 (2-17)

*The differences between the two groups were not statistically significant ($P > 0.05$) for all characteristics.

applied twice daily until the burns healed or the patient had to leave the hospital. Each patient was assessed daily for healing, side effects and satisfaction with the treatment. *Aloe vera* mucilage was freshly prepared in a series of steps. After washing the leaves with clean water, they were immersed in a 1%-lysol or 3%-savlon solution for 10 minutes with the open surface facing upwards above the level of the antiseptic solution. The leaves were washed again with clean water and the outer parts of the leaves were peeled off. The mucilage was then squeezed through sterile gauze.

The data were collected and submitted monthly to the principal investigator at Siriraj Hospital. The statistical methods used for data analysis were descriptive statistics, Chi-square or Fisher exact test and Student t-test, where appropriate.

RESULTS

Thirty-eight patients were included in the study, 20 of them receiving *Aloe vera* Linn. mucilage and 18 silver sulfadiazine. The baseline characteristics of the patients were not significantly different for either group, as shown in Table 1. Most of the patients in both groups were cured or improved on the day they left hospital as shown in Table 2. None of the patients required skin grafting. The side effect of local irritation was found in 40-44 per cent of the patients. About one third of the patients were satisfied with the topical treatment they received.

DISCUSSION

The intention of this study was to test the efficacy and feasibility of using *Aloe vera* Linn. mucilage for the topical treatment of minor burns which people could manage at home by them-

Table 2. Treatment results.

Results	<i>Aloe vera</i> group (n = 20)	Silver sulfadiazine group (n = 18)
Efficacy*(%)		
Cured	55	39
Improved	40	44
Not improved	5	17
Side effects (%)		
None	35	39
Yes**	40	44
Non-evaluable+	25	17
Patients' satisfaction***(%)		
Satisfactory	40	28
Unsatisfactory	5	17
No comment	30	39
Non-evaluable+	25	17

* Cured = complete epithelialization.

Improved = partial epithelialization which may require grafting.

Not improved = no new epithelialization.

** Irritation, itching

*** Satisfactory = the patient would use the same medication if he had a burn in the future.

Unsatisfactory = the patient wouldn't use the same medication if he had a burn in the future.

No comment = it's up to the doctor.

+ Non-evaluable = the patients responding were small children.

selves. It is quite difficult to keep such patients in the hospital for daily observation because some do not want to be admitted or some hospitals refuse to participate because there are no beds available for such patients whom they would treat in clinical practice as out-patients. Therefore, the number of patients in each group was small and this could be a factor of accounting for the lack of significant difference between the two groups. From 40 to 44 per cent of the patients showed improvement up to the day they left the hospital and it is speculated that nearly all of them would be totally cured eventually. Therefore, the success rate of the treatment was judged to be 83-95 per cent. Most of the patients who were not improved were those who had the burns treated for only few days. There was no association between the antibiotic treatment and the rate of healing or infection of the burns. Nearly all the antibiotics used were penicillin V or ampicillin

which are not effective against *S. aureus* or Gram-negative rods, which are, the most common causes of burn infections. Although local side effects were commonly observed, it would be difficult to differentiate between the burning sensation patients experienced after the topical agents were applied as being a result of the topical agents causing irritation or the mechanical action of application causing the irritation.

CONCLUSION

It is suggested that mucilage of *Aloe vera* Linn., if appropriately prepared, is effective and safe for the topical treatment of minor burns.

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