Clinical abstracts

Radiation, burns & frostbyte

Treatment Of Experimental Frostbite With Pentoxifylline & Aloe Vera Cream

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Arch Otolaryngol Head Neck Surg 121(6):678-80 1995 Jun

OBJECTIVE: To compare the therapeutic effects of systemic pentoxifylline and topical Aloe vera cream in the treatment of frostbite. DESIGN: The frostbitten ears of 10 New Zealand white rabbits were assigned to one of four treatment groups: untreated controls, those treated with Aloe vera cream, those treated with pentoxifylline, and those treated with Aloe vera cream and pentoxifylline. MAIN OUTCOME MEASURES: Tissue survival was calculated as the percent of total frostbite area that remained after 2 weeks. RESULTS: The control group had a 6% tissue survival. Tissue survival was notably improved with pentoxifylline (20%), better with Aloe vera cream (24%), and the best with the combination therapy (30%). CONCLUSION: Pentoxifylline is as effective as Aloe vera cream in improving tissue survival after frostbite injury.

Prevention Of Ultraviolet Radiation-Induced Suppression Of Contact & Delayed Hypersensitivity By Aloe Barbadensis Gel Extract

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J Invest Dermatol 102(2):197-204 1994 Feb

We investigated the ability of Aloe barbadensis gel extract to prevent suppression of contact hypersensitivity (CHS) and delayed-type hypersensitivity (DTH) responses in mice by ultraviolet (UV) irradiation. Local immune suppression was induced in C3H mice by exposure to four daily doses of 400 J/m2 UV-B (280-320 nm) radiation from FS40 sunlamps, followed by sensitization with 0.5% fluorescein isothiocyanate (FITC) through the irradiated skin. Topical application of 0.167-1.67% Aloe gel after each irradiation significantly reduced this suppression. Aloe treatment partially preserved the number and morphology of Langerhans and Thy-1+ dendritic epidermal cells in skin, compared to those in the skin of mice given only UVR or UVR plus the vehicle. Experiments using a single (2 kJ/m2) dose of UVR followed by Aloe treatment showed that the effect of Aloe was not due to screening of the UVR. Systemic suppression of DTH to Candida albicans or CHS to FITC was induced in C3H mice exposed to 5 or 10 kJ/m2 UV-B radiation, respectively, on shaved dorsal skin and

sensitized 3 d later with a subcutaneous injection of formalin-fixed Candida or FITC painted on unirradiated, ventral skin. Treatment of the UV-irradiated skin with Aloe immediately after irradiation prevented suppression of both DTH to Candida and CHS to FITC. Aloe treatment did not prevent the formation of cyclobutyl pyrimidine dimers in the DNA of UV-irradiated skin or accelerate the repair of these lesions. These studies demonstrate that topical application of Aloe barbadensis gel extract to the skin of UV-irradiated mice ameliorates UV-induced immune suppression by a mechanism that does not involve DNA damage or repair.

Experimental & Clinical Observations On Frostbite

Heggers JP; Robson MC; Manavalen K; Weingarten MD; Carethers JM; Boertman JA; Smith DJ Jr; Sachs RJ

Ann Emerg Med 16(9):1056-62 1987 Sep

Experimental ischemia by the classic frostbite rabbit ear model clearly defined the role of thromboxane as a mediator of progressive dermal ischemia in frostbite injuries. The therapeutic groups consisted of the antiprostanoids, methylprednisolone, and aspirin combined with anti-thromboxane agents Aloe vera and methimazole, while the control group received no therapy. Survival was measured by planimetry for all groups. No tissue survival was evident in the frostbite control group. Methimazole treatment allowed 34.3% survival, Aloe vera 28.2% survival, aspirin 22.5% survival, and methylprednisolone 17.5% survival. The data compare the results of a modified frostbite protocol using ibuprofen with therapeutic modalities used by other clinical services. Of 154 patients treated for frostbite from 1982 to 1985, 56 were treated with our frostbite protocol; 98 were treated with other modalities. Of the 56 protocol patients, 18 suffered 1st degree frostbite, 25, 2nd degree frostbite, and 13, 3rd degree frostbite. For all degrees of frostbite, 67.9% healed without tissue loss, 25.0% healed with partial tissue loss, and 7% required amputation (P less than .001). Of the patients not on protocol, 11 suffered 1st degree frostbite, 51, 2nd degree frostbite, and 36, 3rd degree frostbite. Of these, 32.7% healed without tissue loss, 34.6% healed with tissue loss, and 32.7% required amputation. The morbidity of progressive dermal ischemia in frostbite may be decreased by the therapeutic use of inhibitors of the arachidonic acid cascade.

Alvagel As A Therapeutic Agent In The Treating Of Radiation Burns

Collins CE; Collins C

The Radiological Review June 1935

1934 - Dr. C. E. Collins, a Maryland physician, and his son, Creation Collins. In several cases of roentgen (radium) dermatitis, the Collinses found that by treating ulcerated skin tissue of their patients with packs of fresh Aloe vera leaves split and wrapped around the wounds, they were able to witness a markedly improved rate of healing. Additionally, they formulated a compound from fresh Aloe vera gel which also netted effective results in the same patterns of usage. In a medical journal in 1935, Creston Collins offered this summary of his report: “Since April 1934, we have treated more than fifty cases of x-ray and radium burns with Aloe vera leaf and an ointment known as ‘Alvagel’ made from the leaf. While they have not all been perfect cures, the results as a whole have been most gratifying.”

Experimental Acute Radiodermatitis Following Beta Irradiation

Lushbaugh CC; Hale DB

Cancer 1953. p. 698

In 1953, tests by Lushbaugh and Hale involving the use of Aloe vera on laboratory animals were conducted under the auspices of the U.S. Atomic Energy Commission. In their experiments two army doctors, Lushbaugh and Hale, exposed different test groups of rabbits to beta irradiation (the same type of radiation found in nuclear fallout) and then treated the subjects with fresh Aloe vera and a commercially prepared Aloe vera "ointment." After several months of testing, the two men concluded that Aloe vera was found to hasten both the degenerative and reparative phases of the lesions, enabling complete healing to be effected within two months of exposure. Since healing from radiation can take months and even years, it's unequivocal in their recommendations that "further explorations should be pursued."

Aloe Vera, Renascence Of A Traditional Natural Drug As A Demo-Pharmaceutical

Burger A; Grubert M; Schuster O
Frederick Cancer Res. Dev. Cent., Natl. Inst. Health

SOFW J. (1994) 120 (9), 526, 528-9

Aloe vera (Aloe barbadensis) was frequently used in Europe as a laxative in the past. Today, a lot of softening skin care products contain the mucilaginous hydrenchyma of the Aloe vera leaf, Aloe vera gel. A pilot study performed with 12 volunteers to examine efficiency and tolerance of Aloe vera gel formulations could generally confirm some wound healing properties. The efficiency of treatment (verum vs. placebo) in exptl. induced superficial skin lesions and UV-erythemas with Aloe vera gel was evaluated by description of the clin. status and colorimetric measurement of the skin color. Aloe vera gel is used as a natural alternative in the medication of mild to moderate skin injuries and burns.

Frostbite, Methods To Minimize Tissue Loss

McCauley RL; Heggers JP; Robson MC
Department Of Surgery, University Of Texas Medical School

Postgrad Med 88(8):67-8, 73-7 1990 Dec

If frostbite is to be treated successfully, direct and indirect effects of injury must be understood. Rapid rewarming helps to preserve tissue by limiting the amount of direct cellular injury. Selective management of blisters helps protect the subdermal plexus, and application of Aloe vera cream combats the local vasoconstrictive effects of thromboxane. Oral administration of ibuprofen decreases systemic levels of thromboxane.

Current Status Of Aloe Vera As Cure-All

Gjerstad, Gunnar; Riner TD

American Journal Of Pharmacy 1968. Vol 140, p. 62

In 1959 Dr. E.P. Pendergrass found that juice from the Aloe vera leaf gave excellent results in the treatment of radiation reactions. And after test in various hospitals (treating regular burn patients) revealed that an Aloe vera ointment was at least 50% better than three other remedies considered most advantageous for burn treatment.

Results from many of these findings were submitted in 1959 to the Food and Drug Administration. After reviewing the material the FDA responded with this summary: "...upon review the FDA admits the (Aloe) ointment does actually regenerate skin tissue." (Flagg, J. "Aloe Vera Gel in Dermatological Preparations," American perfumer. 1959. Vol. 74, p. 27)

Studies On Chemical Protectors Against Radiation XXXI. Protection Effects Of Aloe Arborescens On Skin Injury Induced By X-Irradiation

Sato Y; Ohta S; Shinoda M
Faculty Of Pharmaceutical Sciences, Hoshi University

Yakugaku Zasshi 110(11):876-84 1990 Nov

Protective effects of Aloe arborescens (AA) on mouse skin injury induced by soft X-irradiation were examined. The mechanisms on radiation protection by measuring scavenge activity of activated oxygen, protective effects of nucleic acid, induction of antioxidative protein and so on were further investigated. Consequently a significant protective effect of skin injury was observed in AA S6-3-b. As the mechanisms of radiation protection in AA, the following matters were found. AA S6-3-b showed scavenge activity of hydroxyl radicals generated by Haber-Weiss reaction. AA S6-3-b suppressed the changes of activity in superoxide dismutase and glutathione peroxidase at 7d after soft X-irradiation. Metallothionein was induced in the skin and liver against normal mice at 24 h after administration of AA S6-3-b.

Studies On Chemical Protectors Against Radiation XXVI. Protective Effect Of Various Extracts On Crude Drugs On Skin Injury Induced By X-irradiation

Sato Y; Ohta S; Sakurai N; Shinoda M

Yakugaku Zasshi Vol 109, ISS 2, 1989, P113-8

The protective potency against skin injury on mice induced by X-irradiation was studied by use of 72 extracts of crude drugs. The protective potency was determined according to the degrees on skin injury after irradiation of 1100R, 30 k Vp soft X-ray. As a result of these study, 16 kinds of crude drugs such as Rosae Fructus, Aloe arborescens (Herba), Citri Leiocarpae Exocarpium, Schizonepetae Spica, Evodiae Fructus, Bupleuri Radix, Corni Fructus, Perillae Herba, Anemarrhenae Rhizoma, Menthae Herba, Trapae Fructus, Angelicae Dahuricae Radix, Sinomeni Caulis et Rhizoma, Ephedrae Herba, Acer nikoense (Cortex), Forsythiae Fructus, revealed protective potencies on skin injury.

Studies Of The Status Of Antioxidant Enzymes & Metabolites Following Burn Injury, & The Presence Of Antioxidant Enzymes In The Aloe Vera Plant (Tumor Necrosis Factor Glutathione)

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Dissertation Abstracts International (1995) Vol. 56, No. 12B, p. 6728

Part I. The effects of skin burn injury on the levels of oxidized and reduced glutathione, malondialdehyde, and on the activities of glutathione peroxidase, glutathione S-transferase, and glutathione reductase were determined in liver and lung of rabbit models, 24-h post-burn. The data obtained are indicative of a major oxidative stress in liver and lung tissues due to burn injury at a remote site. Tumor necrosis factor (TNF), a mediator in the pathogenesis of endotoxic shock and burn injury, is associated with decreased glutathione levels. Depletion of cellular glutathione by chemical agents enhanced the release of TNF from lipopolysaccharide (LPS) - stimulated rabbit lung macrophages. Glutathione repletion of macrophages, using glutathione diesters, inhibited LPS - stimulated TNF secretion. Thus, glutathione diesters may have therapeutic value in treating endotoxic shock and burn injury.

Part II. Two antioxidative enzymes, glutathione peroxidase (GSHPx) and superoxide sismutase (SOD), which are involved in scavenging reduced oxygen species, have been purified and characterized from the Aloe vera plant. GSHPx activity was purified to homogeneity by ion exchange and gel filtration chromatography. The enzyme is apparently a tetramer with a sub-unit molecular mass of 16 kD, with one atom of selenium per subunit. The Km values are 3.2 mM for glutathione and 0.26 mM for cumene hydroperoxide. The enzyme is competitively inhibited by N, S, bis-fluorenylmethoxy-carbonyl glutathione. Superoxide dismutases from both the gel and the rind of Aloe vera were purified by ion exchange chromatography. Seven SOD activities were detected, with identifiable differences in their relative distribution in rind and gel. Two of these contain manganese with native molecular masses of 42 and 43 kD and five others are copper/zince SODs with molucular masses of 31-33 kD. Aloe vera SODs have high specific activities; these high activities may relate to the plant's healing properties of inflammatory disorders.

Aloe Vera

Klein AD; Penneys NS
Department Of Dermatology, University Of Miami School Of Medicine
J Am Acad Dermatol, 18(4 Pt 1):714-20 1988 Apr

We reviewed the scientific literature regarding the Aloe vera plant and its products. Aloe vera is known to contain several pharmacologically active ingredients, including a carboxypeptidase that inactivates bradykinin in vitro, salicylates, and a substance(s) that inhibits thromboxane formation in vivo. Scientific studies exist that support an antibacterial and antifungal effect for substance(s) in Aloe vera. Studies and case reports provide support for the use of Aloe vera in the treatment of radiation ulcers and stasis ulcers in man and burn and frostbite injuries in animals. The evidence for a potential beneficial effect associated with the use of Aloe vera is sufficient to warrant the design and implementation of well-controlled clinical trials.

Aloe Jelly Decomposes Bradykinin

Yagi, Akiar

Akiar Yagi confirmed that the enzyme (glycoprotein) in Aloe jelly decomposes bradykinin which causes inflammation. He also confirmed the fact that aloe has a splendid action to promote DNA (=deoxyribonucleic acid) synthesizing which will accelerate cell multiplication. It is certain that these aloeulcin and enzyme are rendering great service to treatment for burns.

Beneficial Effects Of Aloe In Wound Healing

Heggers JP; Pelley RP; Robson MC
Department Of Surgery & Graduate School Of Biomedical Sciences, University Of Texas Medical Branch
Phytotherapy Research (1993) Vol 7, No. Special issue, pp. S48-S52. 10 pl. (5 col. pl.). 17 ref.

The therapeutic effects of A. vera [A. babadensis] were examined in preventing progressive dermal ischaemia caused by burns, frostbite, electrical injury, distal dying flap and intra-arterial drug abuse in man and animal models. In vivo analysis of these injuries showed that the mediator of progressive tissue damage was thromboxane A2 (TxA2). Experimentally, A. vera was compared to a variety of antithromboxane agents (U38450, a lodoxamide, a lazaroid and an Aloe wound gel). In the burn injury, A. vera was comparable to the lodoxamide and lazaroid with an 82% to 85% tissue survival when compared with the control and the Aloe wound gel. Tissue survival in the experimental frostbite injury was 28.2% when compared with the control. Similar results were obtained for the electrical injury, and intra-arterial drug abuse. Clinically burn patients treated with A. vera healed without tissue loss as did those with frostbite. In the intra-arterial drug abuse patients, A. vera reversed tissue necrosis. This therapeutic approach was used to prevent progressive tissue loss in each injury by actively inhibiting the localized production of TxA2. A. vera not only acts as a TxA2 inhibitor but maintains a homeostasis within the vascular endothelium as well as the surrounding tissue.

Comparative Evaluation Of Aloe Vera In The Management Of Burn Wounds In Guinea Pigs

Rodriguez-Bigas M; Cruz NI; Suárez A
Surgical Research Laboratories, University Of Puerto Rico School Of Medicine
Plast Reconstr Surg 81(3):386-9 1988 Mar

An experimental study was designed using Hartley guinea pigs, who received full-thickness burns covering 3 percent of their body surface area by direct contact with a hot plate. A total of 40 animals were equally divided among four modalities of closed burn wound management as follows: group I: silver sulfadiazine (Silvadine); group II: Aloe vera gel extract; group III: salicylic acid cream (aspirin); and group IV: plain gauze occlusive dressing only. The dressings were changed daily, and the size and appearance of each burn wound were recorded until complete healing. On the sixth postburn day, quantitative burn wound cultures were

made. The average time to complete healing in the control group was 50 days, and the only significant difference was found in the Aloe vera-treated animals, which healed on an average of 30 days (p less than 0.02). Wound bacterial counts were effectively decreased by silver sulfadiazine (p = 0.015) and by Aloe vera extract (p = 0.015). From our data it appears that Aloe gel extracts permit a faster healing of burn wounds.

Effect Of Aloe Vera Gel To Healing Of Burn Wound, A Clinical & Histologic Study

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Department Of Surgery, Faculty Of Medicine, Ramathibodi Hospital, Mahidol University
Journal of The Medical Association of Thailand (1995 Aug) 78 (8) 403-9

In a study of twenty-seven patients with partial thickness burn wound, they were treated with Aloe vera gel compared with vaseline gauze. It revealed the Aloe vera gel treated lesion healed faster than the vaseline gause area. The average time of healing in the Aloe gel area was 11.89 days and 18.19 days for the vaseline gauze treated wound. Statistical analysis by using t-test and the value of P < 0.002 was statistically significant. In histologic study, it showed early epithelialization in the treated Aloe vera gel area. Only some minor adverse effects, such as discomfort and pain were encountered in the 27 cases. This study showed the effectiveness of Aloe vera gel on a partial thickness burn wound, and it might be beneficial to do further trials on burn wounds.

The External Use Of Aloes

Crewe JE
Minnesota Journal of Medicine October 1937. Vol. 20. pp. 538-539

In 1937 and again in 1938, Dr. J.E. Crewe reported (in the *Minnesota Journal of Medicine*) a broader spectrum application of Aloe vera in treating chronic ulcers, eczema, thermal burns, scalding, sunburn, pruritus vulvae, minor injuries, and certain allergies including poison ivy. As the Collinses before him, Crewe had also tried using both the fresh leaf gel and an ointment made from it. In almost all cases treated, Dr. Crewe was able to record healing that ranged from effective to remarkable. And in all instances mentioned healing was complete, and tissue regenerated without scarring.
