

PRELIMINARY AND SHORT REPORTS

TOPICAL CHLOROPHYLL THERAPY IN THE DERMATOSES*

ISRAEL ZELIGMAN, M.D., D. MED. SCI.

One of the active chemical principles in plants is chlorophyll, the green respiratory enzyme essential in the process of converting carbon dioxide to starch by photosynthesis. To Willstaetter (1) and his coworkers belongs the credit for showing that chlorophyll is essentially a magnesium porphyrin compound closely related structurally to hemin, an iron porphyrin compound.

Experimental evidence by Burgi (2), Gruskin (3) and Smith and Livingston (4, 5) has revealed the excellent beneficial effects of chlorophyll in wound healing. Smith (6) convincingly demonstrated the relative non-toxicity of the water-soluble derivatives of chlorophyll and also showed that chlorophyll, though not bactericidal, was quite bacteriostatic.

Burgi (2), who believed that chlorophyll acts as a vitamin, showed it was effective in promoting healing and granulation tissue. Burns, wounds and suppurative diseases respond well to chlorophyll preparations (Bowers (7), Collings (8), Finkel and Levine (9) and Morgan (10)).

A number of investigators have found that ulcerations respond favorably to topical chlorophyll therapy. Boehme (11) concluded that an ointment containing 1% water-soluble chlorophyll is more efficacious than any previously used agents for the local treatment of chronic varicose ulcers of the leg. Bowers (7) found it excellent in the treatment of indolent ulcers, as well as being a good deodorant. Finkel and Levine (9) noted its favorable action in the treatment of traumatic ulcers. Gahan, Kline and Finkle (12) successfully used chlorophyll ointment in 7 of 10 varicose ulcers, in 1 ulcer associated with acrodermatitis chronica atrophicans, 1 x-ray burn, 6 ulcers due to trauma or burn, 1 pyogenic ulcer and in 4 patients with ulcers of unknown origin. One of their patients developed a contact sensitivity to the preparation. Gruskin (3) quoted a personal communication from Wright who reported success in the treatment of chronic ulcers of the varicose type. Holmes and Mueller (13) found that post-irradiation erythema responded far better to chlorophyll ointment than to vaseline or boric acid ointment, but that this treatment failed to yield satisfactory results in chronic roentgen ulcers. Of 50 patients with chronic skin ulcers, Morgan (10) reported that all but 2 healed with topical chlorophyll therapy. Twenty-eight were varicose, 6 arteriosclerotic, 6 diabetic, 5 decubitus, 2 malignant and 3 of undetermined origin. In 12 patients with bilateral or multiple varicose ulcers who received simultaneous comparative therapy with other medicaments, the lesions treated with chlorophyll required less time for healing.

Chlorophyll preparations have also been employed in the treatment of various dermatoses. Gruskin (3) quoted a personal communication from Wright who obtained good results in impetigo contagiosa. Langley and Morgan (10, 14) reported a series of 40 cases, 36 of which responded to chlorophyll ointment after other methods of therapy had failed. There were 8 cases of contact dermatitis all of which were cured. Of 13 cases of stasis dermatitis, 12 were objectively cured or improved. Five cases of neurodermatitis healed as did 3 of seborrheic dermatitis, 2 of exfoliative dermatitis, and 2 of infantile eczema. Two of 3 cases of sycosis vulgaris improved. One case of "pyogenic fungus" infection healed as did one of vulvar moniliasis. One case of nummular eczema and one of psoriasis were considered failures.

* From the Division of Dermatology, Department of Medicine, Johns Hopkins Hospital and School of Medicine.

Received for publication April 10, 1949.

PROCEDURE

One per cent water-soluble chlorophyll in a hydrophilic ointment base* was used in the clinical investigation of several dermatoses. Wherever possible, comparative treatment was evaluated simultaneously; and except in the ulcerative cases or those of hemostatic eczema, only symmetrically distributed eruptions were studied. As the study proceeded, it was evident that best results were being obtained with skin ulcers and with hemostatic eczema. These cases were then studied particularly, even though in most instances symmetrical lesions were not present. In view of the frequent association of hemostatic ulcers and hemostatic eczema, these two entities were grouped together in this study.

RESULTS

Of 10 cases of hemostatic eczema and/or ulcers, chlorophyll ointment was found more effective in 7 cases than previous or simultaneous treatment and was considered effective therapy.

One case of roentgen-ray ulcer and one with several factitious ulcers also were improved.

In 12 cases of chronic eczematoid dermatitis characterized by erythema, scaliness and lichenification, chlorophyll ointment was found to be less effective than previously used medicaments in 9; and in one, it caused a contact dermatitis. It was found beneficial in only 4 cases.

In 3 cases of eczematous dermatitis characterized by erythema and vesiculation, chlorophyll ointment was found to be less effective than other local applications. These cases included one of contact dermatitis, one of nummular eczema and one of a vesicular dermatitis of unknown etiology.

In 2 cases of superficial fungous infections, chlorophyll was ineffective. In 2 of 3 cases of pyoderma, chlorophyll was less effective than ammoniated mercury ointment. In the other case, the two topical medications were of equal value. A case of seborrheic dermatitis which failed to respond to chlorophyll ointment was satisfactorily treated with sulfur ointment. A case of exfoliative dermatitis responded slowly but more effectively than to other topical medicaments simultaneously tried. A case of vitiligo failed to show any response to application of chlorophyll ointment.

SUMMARY AND CONCLUSIONS

- (1) The literature of topical chlorophyll therapy is reviewed.
- (2) Chlorophyll ointment was found to be an effective method of treatment and an improvement in therapeutic approach in cases of hemostatic eczema and/or ulcers, and in a few ulcers due to other causes.
- (3) Chlorophyll ointment was found to be inferior to other topical applications in the treatment of 15 cases of lichenified dermatitis, 3 cases of vesicular dermatitis, 3 cases of pyoderma and 2 cases of superficial fungous infection.

REFERENCES

1. WILLSTAETTER, R. u. STOLL, A.: Untersuchungen ueber Chlorophyll, Berlin, Springer, 1913.
2. BURGI, E.: Ueber die Wirkung von Chlorophyll auf die Wundheilung, Schweiz. Med. Wehnschr. **18**: 483-485, 1938.
3. GRUSKIN, B.: Chlorophyll—Its therapeutic place in acute and suppurative disease, Am. J. Surg. **49**: 49-55, 1940.
4. SMITH, L. W. AND LIVINGSTON, A. E.: Chlorophyll: An Experimental Study of Its Water-Soluble Derivatives in Wound Healing, Am. J. Surg. **62**: 358-369, 1943.
5. SMITH, L. W. AND LIVINGSTON, A. E.: Wound Healing: An Experimental Study of Water-Soluble Chlorophyll Derivatives in Conjunction with Various Antibacterial Agents, Am. J. Surg. **67**: 30-39, 1945.

* Chloresium Ointment was supplied by the Rystan Company, Mt. Vernon, N. Y.

6. SMITH, L. W.: Chlorophyll: An Experimental Study of Its Water-Soluble Derivatives, *Am. J. M. Sc.* **207**: 647-654, 1944.
7. BOWERS, W. F.: Chlorophyll in Wound Healing and Suppurative Disease, *Am. J. Surg.* **73**: 37-50, 1947.
8. COLLINGS, G. H., JR.: Chlorophyll and Adrenal Cortical Extract in the Local Treatment of Burns, *Am. J. Surg.* **70**: 58-63, 1945.
9. FINKEL, M. E. AND LEVINE, A. J.: Chlorophyll Urea Ointment, *Indust. Med.* **14**: 730, 1945.
10. MORGAN, W. S.: Chlorophyll Therapy, *Guthrie Clin. Bull.* **16**: 94-107, 1947.
11. BOEHME, E. J.: The Treatment of Chronic Leg Ulcers with Special Reference to Ointment Containing Water-Soluble Chlorophyll, *Lahey Clin. Bull.* **4**: 242-245, 1946.
12. GAHAN, E., KLINE, P. R. AND FINKLE, T. H.: Chlorophyll in the Treatment of Ulcers, *Arch. Dermat. & Syph.* **47**: 849-851, 1943.
13. HOLMES, G. W. AND MUELLER, H. P.: Treatment of Post-Irradiation Erythema with Chlorophyll Ointment, *Am. J. Roentgenol.* **50**: 210-213, 1943.
14. LANGLEY, W. D. AND MORGAN, W. S.: Chlorophyll in the Treatment of Dermatoses, *Pennsylvania Med. J.* **51**: 44-48, 1947.