

VITAMIN D AND ACNE

A COMPARISON WITH X-RAY TREATMENT

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THERE is probably no skin disease of greater importance to the human race than acne. It is undoubtedly our commonest skin disease, and it is rare that any individual reaches maturity without having had it in one of its phases. It is a disease of considerable economic importance, as the disfiguring scars of a severe case are never completely obliterated. It is also a disease of youth. It attains its most noxious form at the time the individual first has to earn his own living. It is undoubtedly responsible for many failures in getting business positions. It is also the basis for inferiority complexes and discouragement in young people.

The dermatologist sees only a small percentage of patients, since many patients are not treated in the expectancy of the condition being outgrown. A goodly percentage is treated over the drug counter or by the family doctor, usually with little success. In dermatological practice, acne cases are likely to rank about third in the frequency of skin diseases, and for this reason are of considerable importance to the specialist. The dermatologist has many weapons with which to attack the disease,

MEASURES

I hardly need call to your attention, as dermatologists, the dissatisfaction of treatments; but I will run over them briefly.

VIOSTEROL IN ACNE

In 1933, I started, in acne cases, giving viosterol- Vitamin D by mouth. This was stimulated later by the results of A. Doktorsky and S. S. Platt.(4) I read an abstract of this paper in January, 1934, in the Year Book of Dermatology. I then began to use vitamin D in all cases, and have continued it up to the present time. The use of vitamin D seemed to fit in where needed. It improved the patients' general nutrition; many of them put on weight, and the majority of them felt much better. Its use

seemed rational. Vitamin D is synthesized in the skin on exposure to sunlight. Might not this be the factor that caused healing on ultra-violet therapy? Vitamin D is a mobilizer of calcium. It is probably withdrawn from its reservoir in the skin at puberty for the purpose of the utilization of calcium in growth of bone and muscle. Vitamin D has the further advantage of reasonable cost. The subject of vitamin effects in the body is so large that I will not attempt to make a prolonged dissertation on the subject. The Council of Pharmacy and Chemistry state that the following are allowable claims in relation to vitamin D:

"Animal experimentation has shown that correction of an inadequate dosage of vitamin D results in the more economical utilization of calcium and phosphorus, and also that the undesirable effects of improper ratios of calcium and phosphorus in the diet can largely be overcome by normal intake of vitamin D. . . . It may be stated that vitamin D has a favorable influence on calcium and phosphorus metabolism."

DANGERS OF VITAMIN D ADMINISTRATION

Dr. C. D. Leake (5) has pointed out that certain dangers exist in the unregulated intake of vitamin D preparations. The symptoms brought on by vitamin D toxicity appear about two weeks after the high daily dosage begins. The patient is nauseated, dizzy, and has tingling in the extremities. There may also be vomiting, diarrhea, and polyuria. Mild symptoms of toxicity occurred twice in my series of cases. In regard to dosage of vitamin D, we probably have considerable latitude. The statement is made that 200 drops (*editor's note: I do not know the equivalent to vitamin d in drops*) a day may be given with safety to juveniles. The Council on Pharmacy and Chemistry of the American Medical Association suggests a maximum daily dose of 1,000 units in lay advertising. Larger doses, of course, may be given under the supervision of a physician. C. I. Read of Chicago, in a study made of the administration of highly concentrated vitamins of 10,000 X gave to three hundred patients, ranging from seven to seventy-two years of age, doses of from 3,000 to 2,760,000 international units daily, or a maximum of 920 times the normal antirachitic dose of 3,000 international units. This group of forty three patients showed symptoms of toxicity of varying degrees.

GENERAL PHYSICAL EFFECTS

The general physical effects of viosterol administration are those of increase of appetite, improved food absorption, gain in weight, and a general sense of well-being. The reaction of the patients on the mental side has been helpful. Their improvement in appetite, and often a lessening of fatigue, has been factors of value in getting cooperation in treatment. In no instance, except in the above-mentioned cases of intolerance, have I had a patient dissatisfied with this form of treatment. From the standpoint of the physician it effectively answers the old question, "What can we do to improve the patient's general health?"

DISCUSSION

REPORT OF CASES

CASE 1.-December 5, 1936. R. W., age thirteen. Adolescent acne comedone. Sister, age thirty, has acne.

Number of deep lesions present. Given lotio alba cream and viosterol, twenty drops each morning. January 9, 1937. Appetite fine. Skin dry and much better; deeper lesions absorbing.

February 13, 1937. Pimples stopped; blackheads dry. To apply hot compresses to remove.

This patient is illustrative of a normal response. f f f **CASE 2.**-June 17, 1935. Miss B. H., age nineteen. Acne two years. Feels tired; menses normal; bowels somewhat constipated. Acne of deep cystic type in chin area. Viosterol, twenty drops daily, prescribed.

July 9, 1935. Weight 119, gained three pounds; appetite better; still tired; acne distinctly better.

August 6, 1935. Better.

September 3, 1935. Weight 117 pounds. Almost healed. January 31, 1936. No longer tired; feels fine. A few new lesions around Christmas time. Entirely satisfactory. This patient gives evidence of general favorable effect. f f f **CASE 3.**-February 18, 1935. J. D., age seventeen. Severe acne two years. Lesions deep with marked induration. X-ray considered advisable. Given viosterol, twenty drops daily.

March 4, 1935. Distinctly better.

March 22, 1935. Letter stating, "Getting along fine.

Face much better."

April 9, 1935. Letter stating, "Feels much better, and face looks 100 per cent better."

This patient gives verbal evidence of enthusiasm.

CASE 4.-March 16, 1934. C. D. Severe acne vulgaris of the face for three years. Past history was negative. Mother had acne Given lotio alba cream and viosterol, twenty drops daily.

April 27, 1934. Much better.

June 25, 1934. Better; a few pustules with last menses; appetite better; has gained weight.

June 8, 1935. Has been much better, but recently has relapsed moderately. X-ray advised. Given x-ray, sixteen treatments, with complete healing.

This patient demonstrates improvement with partial relapse, but also a slow response to x-ray treatment. This patient would be a slow result with either treatment. The response to viosterol is favorable, however.

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CASE 5.-August 13, 1934. A. C., age 21. Acne, moderately, four years. Has had had one-half years of x-ray treatment by dermatologist elsewhere. Healing unsatisfactory. Menses irregular, and is constipated, high-strung, and nervous. Was given viosterol, twenty drops daily. September 14, 1934. Better.

October 13, 1934. Doing well.

November 10, 1934. Healed. The above case demonstrates healing with viosterol after failure with x-ray.

CASE 6.-August 3, 1935. M. R., age twenty. Severe acne, with scarring, for six years. Had fifteen x-ray treatments by dermatologist elsewhere without healing. Given viosterol, twenty drops daily.

September 30, 1935. Much better. Gained five pounds. May 25, 1936. Having no lesions. Taking forty drops of viosterol daily.

September 28, 1936. Still healed.

Illustrative of healing after x-ray failure.

CASE 7.-June 16, 1936. R. K., age twenty-six. Acne since age fourteen; cystic type. Given viosterol, forty drops daily. On July 10, reduced to thirty drops.

September 18, 1936. Gained six pounds. Has more vigor, larger appetite, sleeps better. Practically healed.

The above patient demonstrates an undoubted response

CASE 8.- November 28, 1936. 'M. NV., age twenty-one, male. Cystic abscesses back of the neck. Given viosterol, twenty drops daily. Advised that x-ray probably would be necessary.

December 11, 1936. Appetite much better. Lesions absorbing.

Takes twenty drops daily.

January 8, 1937. Much better, absorbing.

March 5, 1937. All lesions healed. The above patient demonstrates an exceptional result from what is commonly a resistant form.

CASE 9.-February 29, 1936. F. F., age seventeen. Severe acne for four years on face and back; has considerable scarring. Tires easily, otherwise in good health. Given viosterol, forty drops daily; also iron.

April 18, 1936. Some flare-up with menses.

May 23, 1936. Feels a lot better generally; about 80 per cent improvement.

July 18, 1936. Relapsing. Is living in very hot climate. X-ray advised, and was given thirteen treatments. Healed.

March 4, 1937. Moderate recurrence. The above patient demonstrates healing followed by relapse on change of climate in spite of excessive sunlight, healing with x-ray, with subsequent partial relapse.

CASE 10. October 27, 1935. N. D. M., age twenty-four. Deep cystic acne on face of several years duration. Given viosterol, twenty drops daily; also hydrochloric acid.

November 19, 1935. Two pustules only. Viosterol increased to forty drops daily.

February 18, 1936. Splendid result. Complete healing. November 2, 1936. Did not take viosterol during summer and has relapsed. The patient requests x-ray treatments. X-ray was given; twelve treatments, with complete healing. The above patient demonstrates complete healing with viosterol, with subsequent relapse, followed by healing on a normal amount of x-ray treatment. f f I CASE 11.-August 17, 1936. A. C., age twenty-one. Acne for five years; deep pustular type. Given viosterol, forty drops daily.

October 17, 1936. Viosterol reduced to twenty drops.

About the same.

November 24, 1936. Acne completely healed. Skin oily.

February 11, 1937. Still healed. The above patient demonstrates the healing of acne without influence on the oiliness of the skin.

COMMENT ON AUTHOR S SERIES

My study has taken me through all of my acne cases since 1930. I discarded from my list those patients that failed to report back for a sufficient period to be studied. My total survey comprised 480 cases. The cases eliminated because of incomplete or confusing factors brought the survey down to 255. Of these, 123 patients were treated by means other than the use of viosterol, and 132 on viosterol; 86 were treated with x-ray. The dietary instructions were identical in both series. The patients were instructed to eat plenty of green vegetables and lean meats, preferably rare, with fruits for dessert. The local applications were also identical, being lotion alba or the similar paste-like cream. In a few instances other factors, such as iron or hydrochloric acid, were added because of an existing anemia or digestive disturbance. Of those receiving viosterol the dosage was started at twenty drops each morning. Of these, in many patients the dosage was later increased to forty drops. Eighty drops a day were used on two patients. The reason for the morning- dose was to take advantage of the influence of sunlight on the synthesis of vitamin D in the skin. By testing, I found that the average dropper delivers about thirty drops to a cubic centimeter. The patient received twenty to forty drops daily, a few receiving eighty. The dosage averaged probably **5,000 to 14,000 units at a dose**. Those on the higher dosage may have healed more promptly in a few instances. It is unfortunate that on starting the use of viosterol I did not expect the good results I later observed. I, therefore, have had to rely on a tabulation made from my remarks on each patient's history. I believe, however,

that, if anything, they belittle the actual results, as my satisfaction with the procedure has been complete.

TABLE 1.-Patients Treated With X-Ray Without Viosterol

Not noted one month.....	12
Unimproved at one month... ..	45
Better at one month.....	29
Unimproved at three months ...	17 20%
Better in three months.....	30 35%
Much better in three months	13 15% 15%
Healed at three months....	26 33% 33%
Satisfactory in three months	48%
Healed, final note.....	56 63%
Relapsed	21 25%
Unsatisfactory throughout. ..	20 23.3%
Total number of cases treated with x-ray.....	86

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TABLE 2.-Patients Treated With Viosterol

Not noted one month.....	0
Unimproved at one month.....	6
Better at one month.....	87
Much better at one month. .	38
Healed at one month	1
Total cases viewed at one month..	132
Unimproved at three months.	10 14.2%
Better at three months.8	10.2%
Much better at three months.....	20 28.5% 28.5%
Healed at three months.	32 47.1% 47.1%
Satisfactory in three months	7.7 5.6%
Total viewed at three months	70
Unfavorable on viosterol.	2
Viosterol cases requiring x-ray	3
X-ray advised at the first visit	
found to be not necessary later	9
Relapsed1... ..	1

It is interesting to note in this series that 100 per cent more patients failed to return after one visit, when x-ray was advised, than when viosterol was prescribed. It will also be noted that I have made a direct comparison only with cases treated with x-ray; the only difference in treatment in this series being through the use of x-ray in one series,

and viosterol in the other. Although the number of cases surveyed was considerably greater than those shown, the elimination of the non-x-ray cases has brought the total down to 204.

SUMMARY

I believe I may say that at no time in my dermatological experience have I felt such complete satisfaction with a treatment as I have with the cases of this series. I know that vitamin D is an imperfect weapon to slay this disfiguring disease, but it undoubtedly gives one a feeling of being well defended. From the patients' viewpoint, it has left little to be desired, as they find themselves improving, both in appearance and in general well-being. Many have expressed the sentiment, "Never felt better."

IN CONCLUSION

Briefly, I wish to mention some fortunate side observations in patients presenting other skin diseases.

Two cases of localized scleroderma healed completely. Three patients with alopecia areata grew their hair without other treatment. Psoriatics gave me the impression of improving more rapidly. One patient, a generalized exfoliative case of this disease shown to the San Francisco Dermatological Society at the height of eruption, has stayed well without a spot for a year. One case of old x-ray atrophy improved 100 per cent, and one severe pernio was similarly relieved. Three out of four cases of granuloma annulare healed completely. I recognize that there is much that is intangible in this paper, as personal impressions are apt to be erroneous if enthusiasm is a persuading factor. I have, therefore, examined very critically those cases that were seen before viosterol was being regularly prescribed, and was given only where a "tonic" was considered to be good "policy." The results in these instances were the cause of my future enthusiasm. I have also recorded, in many instances, the enthusiasm of the patients, especially in letters received later. The percentage of cures and marked improvement is still low. Perhaps the dosage is not optimal, or that large doses of calcium should also be used. The other vitamins may further add to success. The wrong tree may have been chosen to bay around and another factor of greater importance missed. I believe that all these things are to be weighed, and that time and usage will bring this out. It is my intention to attack these problems in turn, and hope to report again when a sufficient number of cases have accumulated.

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DISCUSSION

GEORGE V. KULCHAR, M. D. (450 Sutter Street, San Francisco).-The well-controlled series reported by Doctor Maynard suggests that large doses of vitamin D are more effective in the treatment of acne than x-ray. The percentage of satisfactory results, both immediate and permanent, secured with roentgen therapy in his series is considerably less than that usually obtained, and may be due to the most severe cases requiring x-ray therapy. Most observers report from 80 to 95 per cent of satisfactory results with roentgen therapy (McKee, Andrews), and less than 10 per cent of relapses. Unsatisfactory results, including relapses, are due usually to inadequate dosage. By careful preliminary testing, adjustment of dosage, and watching for early evidences of reaction, x-ray therapy in most instances can be carried out to 1200-1500 R doses without injury to the skin. It remains our most effective treatment for acne.

The acne form dermatoses result from a disturbance of the pilosebaceous apparatus. This may be due to external irritation from oils, tars, or gases, or hematogenously by allergens, products of the tubercle bacillus, or the halogens. Their effect on patients with acne vulgaris is well known.

It is reasonable to suppose, as Sulzberger and others have suggested, that some hormonal stimulation of the pilosebaceous apparatus, resulting in the comedone formation, is an important factor in the genesis of acne. The persistence of activity in the sebaceous gland, an invagination of the epidermis, with the secondary invasion of bacteria, results in the acne lesion. Similar keratinizing metaplasia in the pilosebaceous apparatus has been reported by Lowenthal and by Frazier, and Hu in vitamin A deficiency, with the production of comedones over the face, and in numerous instances acne which disappeared on restoring the vitamin A content of the diet to normal. The histological similarity of the lesions reported by these observers to the involuting acne lesion is striking. Because of this I have used vitamin A in 55,000 IU doses daily, in addition to amounts of D equivalent to those used by Doctor Maynard. My patients have not been so well controlled and many received x-ray therapy in addition.

Aside from the "tonic" effects, I have been impressed with its value. However, the percentage of satisfactory results in patients not receiving x-ray have been considerably less. The combination of vitamin A with D may have the advantage, as suggested by the laboratory studies of Gross-Selbeck, of decreasing the toxicity of the latter.

It is only through such well-controlled and extensive studies as Doctor Maynard has made that effectiveness of 132 CALIFORNIA AND WESTERN MEDICINE Vol.49, No.2 vitamin therapy in management of acne, where so many factors are involved, can be determined eventually.

HENRY J. TEMPLETON, M.D. (3115 Webster Street, Oakland).-Several years ago I treated a few cases of acne by means of viosterol. Because of failure to note improvement, I abandoned the treatment. I must state, however, that I kept no careful records of my results and that I did not control the experiment. Moreover, my dosage was five to ten drops a day, which may have been inadequate.

Having heard Doctor Maynard's interesting results dealing with a large series of cases, and feeling the need of something to supplement the one remedy that I believe is of definite value, namely, x-ray, I will resume viosterol therapy in selected cases.

As Doctor Maynard has stated, any favorable action of viosterol on acne might well be due to its influence upon the calcium metabolism. We can recall that calcium has been claimed to have been of value in acne when given intravenously. The well-recognized fact that sun baths are of value in acne may be due to their synthesis of viosterol in the skin. What relationship this bears to the pigment producing mechanism of the skin, I do not know; but it is my experience that the value of sun bathing and ultra-violet light therapy (excluding cases treated by heavy exfoliating doses) is directly proportional to the amount of tanning produced. Acne in the blond patient who freckles and peels but who cannot be tanned, does not respond as well as in the brunette. I should like to ask Doctor Maynard as to whether or not he has noted any difference in results in blond or brunette patients with viosterol?

NELSON PAUL ANDERSON, M.D. (2007 Wilshire Boulevard, Los Angeles).-Doctor Maynard has given us the result of his experience in the therapy of acne vulgaris with vitamin D. This line of therapy should especially appeal to the physician who is continually requested by acne patients to prescribe some general tonic or blood medicine. It would seem advisable, however, to remember that, from a scientific standpoint, the most satisfactory results in medical treatment are those developed for conditions whose etiology is known. In other words, all rational therapeutics is based upon cause. Our knowledge of the etiologic background of acne certainly leaves much to be desired. Personally, I feel that the true etiology of acne has an endocrine basis, but am perfectly frank to admit that at present all treatment of this nature has been unsatisfactory. It may well be that vitamin D, in its regulation of calcium and phosphorous metabolism, also effects changes in the endocrine glands, and that these functional changes in turn act upon the sebaceous glands which are involved in acne vulgaris. The fact that vitamin D apparently benefits acne vulgaris is to me of much less importance than the question of how it produces its benefits.