

High Dose Vitamin A Cures Severe Acne Vulgaris

Walter P. Drake, N.D.

Blue Marble University Medical School
27 Great Marlborough Street
Roseau 00152
Commonwealth of Dominica

Contact Author: wpdrake@hotmail.com
255 Blue Lakes Blvd N, #651, Twin Falls, ID 83301(USA)

Abstract: In this single patient clinical trial of high dose Vitamin A in a 14 year old patient with severe acne vulgaris, it was found that a four month course of 200,000 IU Vitamin A, equivalent to 60 mg/day, completely eradicated the condition, was safe and cost effective, and resulted in no relapse at 4 month post-treatment follow-up.

Key words: Vitamin A, Acne vulgaris, isotretinoin, cystic acne, high dose Retinol, recalcitrant nodular acne, high-dose Vitamin A, non-toxicity of Vitamin A

1. Introduction

One might say that the scourge of puberty is the onset of Acne vulgaris, a condition so disforming the face of young people, that socializing becomes difficult and leads to being singled out for ridicule during the very important formative years.

Cystic acne is considered the most severe case, also known as recalcitrant nodular acne.

Isotretinoin, developed by Hoffman-La Roche (Roche Pharmaceuticals), became the most successful oral treatment for severe acne, and current guidelines propounded by the American Academy of Dermatology recommend a starting treatment dose of 0.5-1mg/kg/day for the first month, to a cumulative dose of 120-150 mg. [1]. One study used an even higher cumulative dose of 220 mg/kg/day and found fewer relapses.[2] The mechanism of action is unknown.

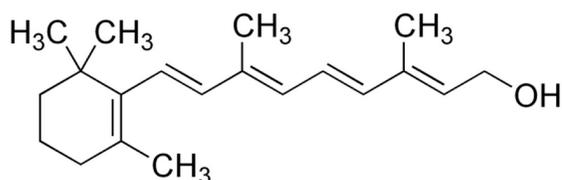
Good general descriptions of acne vulgaris and treatment with isotretinoin (Accutane) are abundant in the medical literature and need not be repeated here. [3,4]. The most common adverse effects are a transient worsening of acne (lasting 1–4 months), chapping of the lips (cheilitis), redness of the skin (erythema), rashes, peeling, eczema (dermatitis), itching (pruritus), and an increased susceptibility to sunburn. [5]

The state of the medical literature is that isotretinoin is usually taken for 3-6 months resulting in lasting improvement in 99% of patients and cure in about 70%. Although there are many other treatment approaches, which include topical creams and antibiotics, in the end, it is only this drug that yields a successful result in the vast majority of patients. [1]

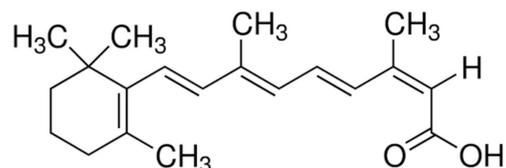
There appears to be some confusion in the medical literature as to whether isotretinoin is a naturally occurring retinoid or a synthetic lab manufactured product. This no doubt benefits the marketing of the synthetic drug. The fact of the matter is that isotretinoin does NOT occur naturally in the body, but is a synthetic analog of retinol, created so that the molecule could be patented as a drug. [6,7,8]

As this paper compares Vitamin A (retinol) to isotretinoin, its pharmaceutical derivative, it would appear helpful to review the molecular structure of each:

Figure 1. Molecular Structure Compared

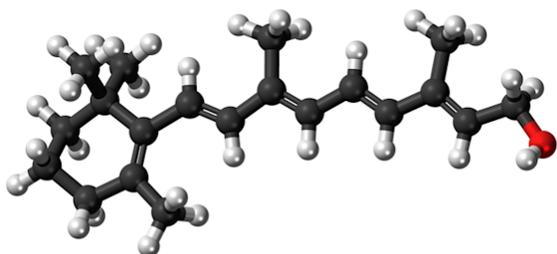


Vitamin A (Retinol): C₂₀H₃₀O

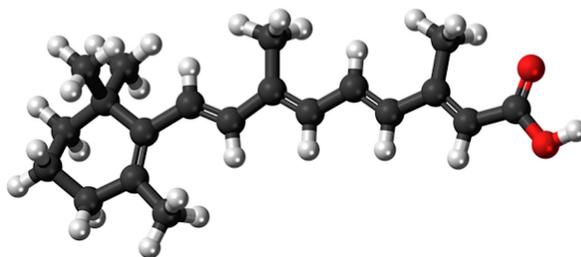


Isotretinoin (Accutane): C₂₀H₂₈O₂

Figure 2. Molecular Structures Ball and Stick Model



Vitamin A (Retinol): C₂₀H₃₀O



Isotretinoin (Accutane): C₂₀H₂₈O₂

The beneficial effect of Vitamin A treatment was first reported by Straumfjord in 1943, using a dose of 100,000 IU. [9] And although many reports confirming its usefulness have been issued over the years, it seems that Vitamin A never caught on as the treatment of choice for severe acne. It was bumped out of clinical use by Accutane, and the dominance of the generic isotretinoin continues to this day.

The high cost of Accutane is legendary. Billions have been earned from its development and sale. This seems peculiar for a drug that has never shown to have any more beneficial effect than high dose Vitamin A, from which it was derived. For the average patient, the cost of the treatment is prohibitive. When the brand name Accutane was introduced in 1982, its estimated cost was about \$2,000 per month, not including all the required lab testing and recurring physician's visits. Currently, the generic isotretinoin retails at various pharmacies for about \$900 for 60x30mg capsules. Even with the best discounts and coupons available, the cost is still about \$200/month. <https://www.goodrx.com/isotretinoin>

Retail Cost of Accutane (isotretinoin) vs Vitamin A 4 Month Course of Therapy-Medication Only

Isotretinoin: \$3600

Vitamin A Capsules: \$100

For a **starting dose** of 1mg/kg/day used by a teenage patient weighing 50 kg (110 lbs), thus requiring 50 mg/day, the best discounted cost of about \$200 worth of drug will only last the first month. Since the recommended cumulative dose is 120-150mg/kg, that patient would need to be on the program for 4-5 months for an estimated **minimal cost** of \$800-\$1,000 for the medication, a likely added cost of \$500 for physician monitoring and writing prescriptions, and additional lab tests of variable cost. Of course, this does not include the hundreds of dollars spent on worthless creams, facial cleansers, benzoyl peroxide products, antibiotics, and whatever else is supposedly needed before the patient can even get to the drug.

Some higher doses of isotretinoin have been used. [2]

Vitamin A, on which isotretinoin is based, is much more affordable and easily obtainable without prescription. 250 softgel capsules containing 25,000 IU Vitamin A costs about \$25. In order to compare dosages with isotretinoin, one capsule containing 25,000 IU is equal to 7.5 mg Vitamin A. [<https://www.rfaregulatoryaffairs.com/vitamin-converter>]

Hence, if we were to substitute 50 mg/day Vitamin A (at 25000IU/7.5mg per capsule), 8 capsules per day would be the equivalent of 60 mg Vitamin A (200,000 IU/day). A month's cost would be about \$25, and a full 4 month course of therapy would cost \$100, less than 2.7% the retail cost of isotretinoin, and a tenth of the cost of isotretinoin at the best discounted rate. Some patients who could not qualify for deep discounts and who would thus have to pay about \$900/month for the drug, would save over \$3500 in prescription, doctors visits, and lab tests by using Vitamin A instead of isotretinoin (Accutane).

The purpose of this study was to test the hypothesis that cheap, readily available Vitamin A is a highly effective alternative treatment for Acne vulgaris, and is as effective as published studies using isotretinoin.

2. Materials and Methods

This paper presents a single patient clinical trial in which a patient with cystic acne was treated with Vitamin A and the results before and after treatment were documented by objective photographic analysis.

Patient Selection. A 14 year old male patient, slender, in good health, weighing 50 kg, volunteered for the study. An Informed Consent was obtained from the parents, who were recruited to assist in the study to ensure compliance with the dosing schedule. The patient, of Asian/Caucasian ethnicity, had suffered from severe Acne vulgaris of the face for 3 years, which had caused him to be severely reclusive with no friends. On initial observation, the patient appeared to have cystic acne, with involvement of the entire face. The patient and parents

reported the many types of over-the-counter topical creams and facial scrubs that had been tried, including the trial of botanicals such as tea tree oil, with no improvement. The patient had also been subjected to two courses of antibiotic treatment with erythromycin and doxycycline with only temporary improvement and without complete resolution. The mother reported severe acne in her formative years which did not clear up until age 21. Based upon the history and observation, it was believed that the patient's condition could be deemed recalcitrant nodular acne of 3 years duration.

Study design. A four month course of daily Vitamin A supplementation was instituted at a daily dosage of 8 softgel capsules 25,000 IU (7.5mg) per capsule, being 200,000 IU (60mg) per day for four months. For the first week only, 100,000 IU (30 mg) was administered per day to ensure no immediate adverse side effects. Subsequently, the patient continued on with 200,000 IU (60 mg)/day. Photos were taken before beginning the trial and after 4 months, by which time complete remission was observed.

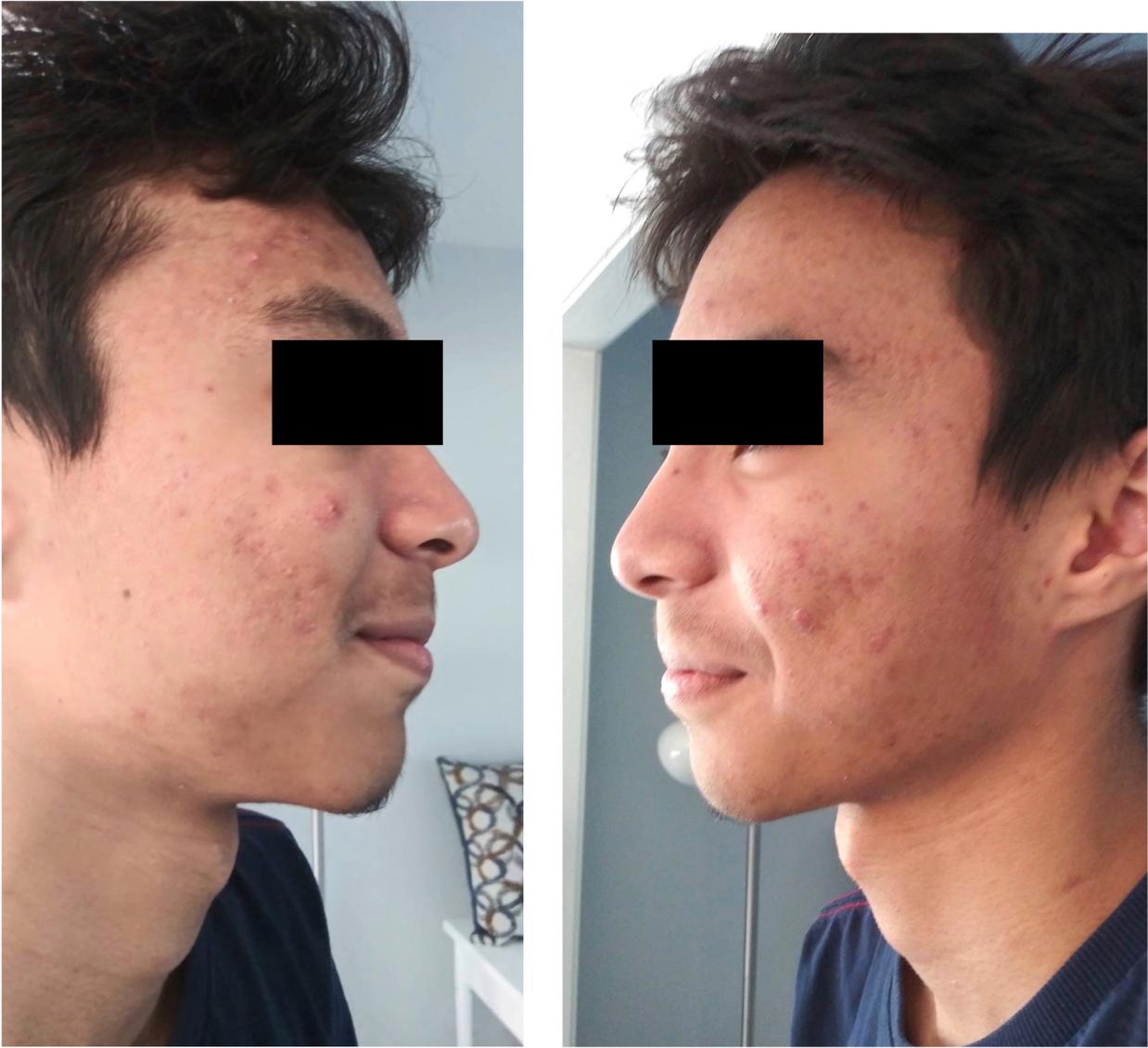
Vitamin A (retinol): Carlson Vitamin A, 25,000 IU, was obtained from online retailer, Amazon. The product is distributed by J.R. Carlson Laboratories Inc., Arlington Heights, IL 60004 (USA), and is derived from cod liver oil and retinyl palmitate, Expiration Date noted: 06/2023. The package indicates 7.5 mg Vitamin A/capsule, in agreement with standard conversion tables. Vitamin converter: <https://www.rfaregulatoryaffairs.com/vitamin-converter>

Similarly, the standard treatment using isotretinoin at 1 mg/kg per day to a cumulative dose of 120–140 mg/kg would occur for 4-4.7 months [10]

3. Results

Treatment was initiated March 15, 2020, and was planned to continue for 4 months, following the typical format used for Accutane (isotretinoin). Weekly follow-ups were scheduled for observation. After the first week of 100,000 IU/day showed no adverse effects, the dose was increased to 200,000 IU/day for the duration of the trial. The patient developed dry, chapped lips for which a lip balm offered relief. In addition, the patient developed observable redness in the face at the upper cheek/nose area, which culminated after one month in dry, flaky and peeling facial skin. These side effects appeared to resolve by 2 months. This condition was left alone and not disturbed with any facial creams or moisturizers because immediate concomitant improvement in acne began to be observed after 1 month. Also, at around 2 months, melanin deposits were evident and began to replace areas of acne and previous pustules. After 3 months, the overall condition was much improved, but the treatment plan was continued to help ensure a lasting result with no relapse. After 4 months the treatment was concluded with complete remission of the condition. At 10 months post treatment initiation (6 months after treatment completion), the patient's face remained completely free of acne. Photographic evidence for the study follows:

Figure 3. Photos Showing Condition Before Start of Treatment



**Figure 4. Two Months-Condition Improving
And Showing Melanin Deposits**



Figure 5. Photo After 3 Months of Treatment



**Figure 6. Photo After 4 Months of Treatment
Acne Fully Resolved**



4. Discussion

This study of the treatment of a patient with recalcitrant nodular acne, also known as cystic acne, demonstrates that Vitamin A is a highly effective treatment, and an inexpensive one as well.

Oral Vitamin A (retinol) at a dose of 200,000 IU per day for four months, was shown to be highly effective in this single patient study, and eradicated a severe acne condition completely. Visible improvement could be seen after one month as fewer and fewer new pustules emerged. The typical side effects of chapping of the lips (cheilitis), redness of the skin (erythema), and peeling, appeared to be of a transient nature, disappearing after about 2 months into the treatment.

The Vitamin A dosage of 200,000 IU is equal to 60 mg/day, and therefore, as shown above, comparable to the usual dose of 50 mg/day for a patient weighing 50 kg (110 lbs) and less than 100 mg/day used in some studies. [2]

In this report and many others, Vitamin A has been shown to be an effective cure for Acne vulgaris. Yet it has never achieved mainstream usage to become the “go to” therapy.

Isotretinoin is the synthetically manufactured analog of Vitamin A that exists nowhere in nature. Yet this expensive compound is the treatment regularly prescribed and used.

It is puzzling why Vitamin A is not the treatment of choice. Could this be due to the underlying and still remaining belief in Vitamin A “toxicity” that is seemingly ingrained in clinical practice?

Isotretinoin has never been shown to be more effective than Vitamin A. Nor with any less side effects. No doubt such a head to head study would likely show a comparable effect generated by Vitamin A, with possibly fewer side effects, and thus obliterate any opportunity to derive substantial income from the sale of the patented pharmaceutical.

It is a further peculiar aspect of the medical literature that numerous stories and reports of Vitamin A toxicity coincided with the introduction of Accutane in the early 1980's. As Accutane was rolled out into the market, titles like the following began to appear, warning of Vitamin A toxicity.

1981: “Chronic vitamin A intoxication. A multisystem disease that could reach epidemic proportions” [15] Reviewing only two cases of multisystem disorders exacerbated by Vitamin A ingestion.

1981: “Vitamin A toxicity and hypercalcemia in chronic liver failure” [11] Measuring serum levels in chronically ill patients

1982: “Case Report: Vitamin A toxicity and hypercalcemia” [12] Reporting on a patient with a history of chronic Vitamin A abuse

1982: “Toxicity of 25,000 IU Vitamin A supplements in health food users” [14] Collecting cases where long term use and combinations of megadoses of vitamins are harmful

1984: “Hepatic Pathology in Vitamin A Toxicity” [13] Reporting on liver disease in a patient taking 150,000 units Vitamin A for 2 years

For the most part, patients experiencing difficulties in these studies were already in serious condition with numerous co-morbidities including necessitating kidney dialysis.

Nonetheless, the current recommended daily allowance for Vitamin A is 3000 IU for men and 2300 IU for women, with max upper intake for both sexes at 9300 IU (retinol/VitaminA). [16]

Meanwhile, as the controversy over Vitamin A toxicity seems to drag on, Klingman et al reported on the daily use of up to 500,000 IU Vitamin A in men (300,000 IU in women) was effective in treating acne vulgaris, and that “toxicity was slight and limited mainly to skin (xerosis) and mucous membranes (cheilitis)”. [17]

The results of this paper support the Klingman conclusion that **“The danger of hypervitaminosis A in this dosage range has been exaggerated. Retinol is a valuable drug for treating stubborn, severely inflammatory acne vulgaris. It is administered until the disease is brought under control, usually within three to four months.”**

The current study is important because it dispels the myth of Vitamin A toxicity in a healthy teenager with Acne vulgaris. Moreover the study demonstrates that Vitamin A is just as effective in curing acne vulgaris as the expensive, synthetic analog, Accutane and its generic, isotretinoin.

Vitamin A should be the first line of defense for patients with acne vulgaris, and its use would save patients the many costs of ineffective creams, ointments, antibiotic, and hormonal treatments, not to mention the high cost of the pharmaceutical drug isotretinoin itself.

References

1. “Guidelines of care for the management of acne vulgaris”, J. Am. Acad. Dermatol. 74:945-73 (2016). <http://dx.doi.org/10.1016/j.jaad.2015.12.037>
2. Blasiak, RC, et al “High dose isotretinoin treatment and the rate of retrial, relapse, and adverse effects in patients with acne vulgaris”. JAMA Dermatol. 149:1392-1398 (2013).
3. Rasi A, et al. “Efficacy of fixed daily 20 mg of isotretinoin in moderate to severe scar prone acne”, Adv Biomed Res. 3:103 (2014).
4. Fischer, J and Ganellin, CR, “Analogue-based drug discovery”, John Wiley & Sons. (2006) at p. 476. ISBN 978-3-527-60749-5.
5. Brelsford, M, and Beute, TC, “Preventing and managing the side effects of isotretinoin”, Seminars in Cutaneous Medicine and Surgery, 27:197-206 (2008)
6. Perry, MD, and McEvoy, GK “Isotretinoin: new therapy for severe acne”, Clin Pharm 2(1): 12-19 (1983)
7. Kontaxakis, VP et al, “Isotretinoin in psychopathology: a review”, *Ann Gen Psychiatry* 8, 2 (2009). <https://doi.org/10.1186/1744-859X-8-2>

8. Hastings J, et al, ChEBI in 2016: Improved services and an expanding collection of metabolites [published online at: <https://www.ebi.ac.uk/chebi/searchId.do?chebiId=CHEBI:6067>, accessed October 27, 2020
9. Straumfjord JV: "Vitamin A. Its effect in acne. A study of one hundred patients", Northwest Med 42: 219-225 (1943)
10. Rademaker, M: "Isotretinoin: dose, duration and relapse. What does 30 years of usage tell us?" Australasian J Dermatology 54:157-162 (2013)
11. Hensen LB et al: "Chronic vitamin A intoxication. A multisystem disease that could reach epidemic proportions", Am J Dis Child 135(7):634-6 (1981)
12. Farrington,K et al: "Vitamin A toxicity and hypercalcemia in chronic liver failure", Br Med J (Clin Res Ed) 282:1999 (1981)
13. Ragavan, VV et al: "Case Report: Vitamin A toxicity and hypercalcemia", The American Journal of the Medical Sciences 283:161-164 (1982)
14. Herbert,V: "Toxicity of 25,000 IU Vitamin A supplements in health food users", Am J Clin Nutr 36(1):185–186 (1982)
15. Forouhar,F et al: "Hepatic Pathology in Vitamin A Toxicity", Ann Clin Lab Sci 14:304-310 (1984)
16. National Institutes of Health, Office of Dietary Supplements, "Vitamin A Fact Sheet for Health Professionals, published online at: <https://ods.od.nih.gov/factsheets/VitaminA-HealthProfessional/#h2> Accessed November 16, 2020.
17. Kligman AM et al, "Oral vitamin A in acne vulgaris. Preliminary report", Int J Dermatol 20(4): 278-285 (1981)

Author Profile



Walter P. Drake, J.D., N.D., is a graduate of Johns Hopkins University, University of Baltimore School of Law, and Blue Marble University. He is a Research Scientist, Attorney, and Doctor of Naturopathic Medicine. He is the principle author of over 25 biomedical research reports published in various scientific journals and has contributed to an additional 9 other scientific articles. Walter is a leading international educator and a respected authority in stem cell science, immunology and naturopathic medicine. His career contributions span over 4 decades.