JOURNAL OF THE AMERICAN GERIATRICS SOCIETY
Vol. XXIII, No. 12


# Thyroid-Adrenocortical Relationships in the Safe Treatment of Arthritis, Allergy, and Skin Disorders with Prednisone

BRODA O. BARNES, MD, PhD*

*Fort Collins, Colorado*

**ABSTRACT: Although the anti-inflammatory action of cortisone or its derivatives is efficacious in arthritis or certain allergic and skin diseases, the standard use of such compounds is limited to short-term administration because of induced disturbances in mineral and glucose metabolism. Another side effect of cortisone is suppression of thyroid hormone secretion. The author has found that when thyroid therapy is prescribed for patients with arthritis (300 to date), certain skin diseases or selected allergic disorders, the addition of prednisone in a small dosage of 5–10 mg daily will produce further improvement for at least a five-year period, without side effects. The thyroid and adrenocortical hormones apparently are synergistic in the treatment of arthritis and allergy.**

Although the steroid drugs have saved many lives in conditions of severe stress, certain side effects such as fluid retention, mineral imbalance and hyperglycemia have restricted their use to short-term therapy. The discovery of the effects of cortisone by Hench et al (1) in 1949 raised hopes for the conquest of rheumatoid arthritis. However, within a comparatively short time, it was found that the huge doses of cortisone became ineffective, and the side effects were more distressing than the arthritis.

Within a year after Hench's report, a comprehensive study by Hill et al (2) at Harvard revealed that the dosages of cortisone employed were suppressing thyroid function. Thus, while the steroids were providing some temporary relief, they were creating hypothyroidism, a disorder that aggravates arthritis.

In the last century, Kocher suggested that thyroidectomy led to acceleration of arthritis; by the turn of the century the British were reporting that thyroid therapy produced improvement in the arthritis accompanying myxedema. It was not until 1914 that Hertoghe (3), a Belgian clinician lecturing to the New York Medical Society, pointed out to Americans that thyroid therapy was beneficial in many cases of muscular and joint disease.

Few investigators were impressed by the news, but again, it was Harvard that had an open mind. Swaim (4) in 1929 reported detailed metabolic studies on 312 cases of arthritis. Although only two-thirds of the patients had a low metabolic rate and a few even had a high rate, both groups showed improvement in circulation, muscle tone, weight, and vitality during thyroid therapy. Swaim, however, administered thyroid up to the patient's limit of tolerance—an unsatisfactory procedure.

Some of Swaim's patients with an elevated metabolic rate showed a reduction in basal metabolism during treatment with thyroid. This was probably the result of improvement in the arthritis and reduction in pain which allowed the patient to relax during the test. On the basis of his extensive studies, Swaim suggested that arthritis develops in patients with low metabolism.

It seems unfortunate that others did not follow his lead. A careful history of a patient with crippling arthritis usually reveals a story of poor circulation, repeated infections over many years, and other stigmata characteristic of low thyroid function. Yet at this late stage of the disease, thyroid therapy alone may be relatively ineffective against the arthritis even though the other symptoms of hypothyroidism respond satisfactorily.

Two major problems remain: 1) prophylaxis of arthritis by early treatment of thyroid deficiencies, and 2) alterations in steroid therapy that will

* *Address:* 2838 West Elizabeth, Fort Collins, CO 80521.

permit prolonged administration in cases of advanced arthritis.

## CLINICAL OBSERVATIONS

For 45 years, my attention has been focused on thyroid deficiencies in both animals and humans. Encouraging results have been obtained with thyroid therapy in patients of all age groups, ranging from a 3-week-old baby with infections to a 97-year-old woman with a broken hip. For more than 30 years, use of the basal temperature as a guide (5) has offered a simple means of avoiding either inadequate therapy or overdosage with thyroid hormone.

*Arthritis.* Many cases of early arthritis have improved over the years, and rarely has a patient become incapacitated. Yet in 1970, a 58-year-old auto mechanic who had been receiving thyroid therapy for three years suddenly developed rheumatoid arthritis in both wrists and hands, rendering him unfit for work. All of the usual treatments for this disorder were without benefit. In desperation, prednisone (5 mg daily) was added to the thyroid therapy. Within one week the marked swelling had subsided, the pain had disappeared, and he had returned to duty. Several attempts to discontinue the prednisone always resulted in debility within two weeks. With use of the combination of drugs, however, he has not lost any work time in nearly five years.

Nevertheless, it was surprising that so small a dosage of steroid should produce such a remarkable effect. A search of the literature was undertaken for an explanation. The articles by Hill et al and by Swaim seemed to offer a rational solution to a longstanding problem. Since adrenal deficiency may occur in cases of hypothyroidism and vice versa, when both diseases occur together it is reasonable to treat them simultaneously.

In 1974 Barnes (6) reported that in 200 patients with arthritis, small dosages of prednisone could be safely added to thyroid therapy. In most cases, a dosage of only 5 mg of prednisone daily was sufficient to produce marked relief from pain, but during severe weather a second 5-mg tablet 12 hours later might be required. Since that report, another 100 patients have been treated, with the same encouraging results.

*Skin diseases and allergy.* As soon as Murray reported successful thyroid therapy in 1891, the British began such treatment for many disorders. Skin diseases such as eczema or lupus responded spectacularly. This has been confirmed over the years by numerous authors as well as by me. In some of my cases, however, the results were disappointing. The addition of 5 mg of prednisone daily has often turned failures into successes.

Only one illustrative case will be mentioned here. A 9-year-old boy had been repeatedly hospitalized by other doctors each winter with severe asthma, eczema and many other manifestations of allergy. Thyroid therapy eliminated most of the asthma and the need for admission to the hospital, but chronic flexural eczema with dry itchy skin caused continual annoyance. After the addition of prednisone (5 mg daily), the eczema disappeared. In eight years, a small puny child turned into a well developed athlete.

*Lack of side effects.* In no case have symptoms of steroidism appeared in the patients who have been treated for a period of at least five years. Repeated blood studies have failed to reveal any disturbances in either mineral or glucose metabolism. The usual side effects from prolonged administration of prednisone (e.g., acne, hirsutism, facial rounding, supraclavicular fat pads, weight gain, headache, hypertension) have been conspicuous by their absence. It seems that, when indicated, the thyroid hormone and prednisone in physiologic dosages can act in complementary fashion.

## DISCUSSION

The simultaneous use of thyroid and adrenocortical compounds is not new. A few patients have both thyroid and adrenal deficiencies, and in such instances the combination therapy should be employed. Most thyroid deficiencies can be recognized by symptoms alone, but use of the basal temperature as an additional guide leaves little doubt. However, if the symptoms fail to respond to thyroid therapy, or if further weakness develops, the addition of adrenocortical derivatives (e.g., 5 mg of prednisone daily) should start at once.

Wayne (7) of Glasgow, Scotland, suggests treating the adrenal deficiency before the thyroid deficiency. However, it seems more rational to use thyroid therapy first, and then steroid therapy only for those patients who fail to respond to thyroid. The methods of measuring adrenal function are cumbersome, expensive and somewhat unreliable. This may account for the divergent opinions among investigators concerning the function of the adrenal cortex in myxedema.

It is new to use both forms of treatment in cases of allergy or arthritis. No one will hesitate to use large doses of cortisone or its derivatives in emergencies, and no one doubts that lives can be saved by so doing. Yet it makes sense to avoid the

crises. No hope can be held for curing either arthritis or severe allergy at present, but my observations over many years strongly suggest that either disease can be controlled and the ravages markedly reduced with physiologic dosages of thyroid and prednisone. There is no reason to believe that other steroid derivatives (in appropriate dosages) would not also be found beneficial.

Until better methods of treating arthritis and allergy appear, the simple use of clinical acumen, a thermometer, and the administration of thyroid to the patients who have a low basal temperature and symptoms of thyroid deficiency will usually bring relief of symptoms. For the patients who do not respond satisfactorily, the addition of a small dosage of prednisone will often produce further improvement.

## REFERENCES

1. Hench PS et al: The effect of a hormone of the adrenal cortex (17-hydroxy-11-dehydrocorticosterone: compound E) and of pituitary adrenocorticotropic hormone on rheumatoid arthritis: preliminary report, Proc Staff Meet Mayo Clin 24: 181, 1949.
2. Hill SR, Reiss RS, Forsham PH et al: The effect of adrenocorticotropin and cortisone on thyroid function; thyroid-adrenocortical interrelationships, J Clin Endocrinol 10: 1375, 1950.
3. Hertoghe E: Thyroid deficiency, Med Rec 86: 489, 1914.
4. Swaim LT: Chronic arthritis: further metabolism studies, JAMA 93: 259, 1929.
5. Barnes BO: Basal temperature versus basal metabolism, JAMA 119: 1072, 1942.
6. Barnes BO: A physiological approach to the prevention and treatment of arthritis. Proc 11th Internat Union Physiol Sci, New Delhi, India, 1974.
7. Wayne EJ: Clinical and metabolic studies in thyroid disease, Brit Med J 1: 1, 1960.