

PRELIMINARY AND SHORT REPORTS

DARKENING OF GRAY HAIR DURING PARA-AMINO-BENZOIC ACID THERAPY*

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Graying of hair has long been a phenomenon of general interest. Although there is evidence that genetic, hormonal, and nutritional elements may all be involved in the process, the exact mechanism of graying remains obscure. (1) It is not surprising, therefore, that numerous substances have been proposed as "cures" for gray hair. After careful clinical evaluation, however, none of these has survived as a form of therapy for this condition. One compound which experienced this cycle during the past decade is paraaminobenzoic acid (PABA). In 1941, Sieve administered 200 mg. PABA daily to 30 patients who had definite achromotrichia. (2) He reported that after about 2 months of treatment all cases had marked darkening of the hair. Brandaleone, et al. (3) studied the effects of the daily administration of 200 mg. PABA, 100 mg. calcium pantothenate, and 50 gm. brewer's yeast to gray-haired subjects. Only 2 of 33 individuals exhibited a significant change in color during an 8 months period. Furthermore, it was not possible to attribute the result in these 2 subjects to PABA alone. Thus, the relationship, if any, of PABA to hair color has remained questionable.

During the past 4 years an extensive investigation of the effects of PABA in a variety of clinical conditions has been conducted in this laboratory. Altogether, about 250 patients have received doses of from 6 to 48 grams daily of this compound.¹ Approximately 150 of the patients have been treated for intervals ranging from 4 weeks to 27 months. Early in the study, a striking example of darkening of gray hair during PABA therapy was observed. This led to careful observation for similar change in all gray-haired patients treated with PABA.

The purpose of this report is to record the apparent effects of PABA on the hair of certain patients incident to its use for their respective primary diseases.

In order to eliminate slight or debatable changes, only those subjects who had markedly gray or graying hair will be considered herein.² Of the 150 patients who were treated for 4 weeks or longer, 20 belonged in this category at the beginning of treatment. In this group were 7 men and 13 women whose ages ranged from 43 to 86 years. Five of the 20 underwent definite change in hair color during PABA therapy. The relevant information concerning these individuals is summarized briefly below.

Case 1. C. C., a 63 year old white male, was placed on PABA therapy for lymphoblastoma cutis (4) on Feb. 11, 1948. He received 2 gm. of the sodium salt (NaPABA) every 2 hours initially. Because of edema, however, the medication was changed to the potassium preparation (KPAB). On Feb. 28, the dosage was reduced to 18 gm. daily, and later to 12-15 gm. where it has since been maintained.

At the time of admission, his hair was gray and sparse. After 2½ months of treatment with

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Aided in part by a grant from the Horace H. Rackham School of Graduate Studies.

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Received for publication June 27, 1950.

¹ PABA is best administered as potassium or sodium-para-aminobenzoate. Generous quantities of PABA were made available for administration to these patients by the B. L. Lemke Co., Lodi, N.J.; Merck & Co., Rahway, N. J.; and Wyeth, Inc., Philadelphia, Pa.

² It should be noted that alteration in hair color was observed in a few non-gray-haired individuals. Changes from light brown to darker brown, and from light auburn to deeper auburn shades have been seen.

PABA, a general regrowth of hair was noted. Furthermore, the roots of the scalp hair were all dark while the tips were gray. Subsequently, all of his hair became medium brown in color. Upon inquiry, it was learned that his hair had been completely gray for at least 15 years preceding the PABA therapy.

Case 2. A. K., a 50 year old white housewife, was started on PABA for the treatment of dermatomyositis (5) on September 18, 1947. NaPAB and later KPAB constituted the only treatment administered over the next 26 months. The dosage was 24 gm. daily for 2 weeks, then 12-14 gm. daily for 6 months. Thereafter, the patient took 6-8 gm. KPAB a day until Dec. 2, 1949. This patient had undergone marked loss of hair which continued during the first months of treatment. By April 12, 1948, however, the hair ceased falling out and some regrowth was noticeable. By July 26, the scalp hair was much denser, and, furthermore, it was dark brown for about 3 inches along the proximal ends of the hair shafts. The distal ends were either light brown or gray. With continued growth and cutting during succeeding months, her hair gradually became uniformly brown.

Case 3. R. F. B., a 68 year old white male, was begun on KPAB therapy for dermatitis herpetiformis (6) on Jan. 25, 1949. He received 18-21 gm. a day. Before treatment, his scalp hair was thin and almost completely gray. Within 2 months, definite regrowth and darkening was noted. These changes were more striking after 5 months of therapy.

Case 4. L. S., a 57 year old white female, was given KPAB for the treatment of a generalized scaly erythroderma believed to be lymphoblastoma cutis. She received 14 gm. daily, beginning on Sept. 12, 1949. Prior to the KPAB therapy, the scalp hair was white and very thin. By Nov. 22, however, the scalp hair was growing in more densely, and the roots were dark while the tips were white. The difference was even more remarkable 3 weeks later.

Case 5. V. E. S., a 42 year old white housewife, was begun on 12 gm. daily of KPAB for the treatment of scleroderma on July 11, 1949. This patient had considerable gray hair at the beginning of treatment. By January, 1950, however, definite darkening had resulted.

DISCUSSION

That darkening of gray hair may result from prolonged administration of para-aminobenzoic acid is evident from the preceding case reports. These subjects had received from 6 to 24 gm. of PABA daily for treatment of their respective primary disorders. The effect on hair color was first noted 6 weeks after PABA therapy was begun in case 4, but a longer interval was usually required to bring about the change. The effect was not uniform, however, since other patients, who received PABA for comparable periods, failed to exhibit significant change in hair color. There appeared to be no correlation between the darkening effect and the duration of grayness prior to treatment with PABA. The color alteration was observed to occur during the administration of PABA alone. Supplemental vitamin therapy appeared not to influence the effect on hair color in these subjects.

It should be noted that these patients were given large quantities of PABA in order to control their disease processes. The amounts used, therefore, were far greater than those employed by others (2, 3) who were deliberately seeking to alter gray hair. The mechanism by which PABA may cause pigmentation of gray hair in certain individuals remains obscure. Discussion at this time would, therefore, be non-contributory. It is hoped, however, that further study of the metabolic activities of PABA will aid in clarifying the pigmentation processes. In this connection it appears worthy of note that in scleroderma and dermatitis herpetiformis, the associated cutaneous hyperpigmentation usually fades to a lighter, more natural coloration during PABA therapy (5, 6).

SUMMARY

Darkening of gray hair was observed in 5 of 20 individuals who received large amounts of para-aminobenzoic acid for treatment of certain clinical disorders. It is not advocated, however, that PABA be administered solely for the purpose of trying to darken gray hair; rather, it is hoped that the observations reported herein may prove to be of value in connection with studies of pigment metabolism.

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