

SERUM ALPHA-1 ACID GLYCOPROTEIN IN THYROID DYSFUNCTIONS

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SUMMARY

The serum alpha-1 acid glycoprotein of 9 euthyroid subjects, 14 hypothyroid patients and 21 hyperthyroid patients was determined by radial immunodiffusion in agar plates. The serum alpha-1 acid glycoprotein level in both the hypothyroid and hyperthyroid patients were significantly lowered when compared to the euthyroid subjects. There was no significant correlation between the alpha-1 acid glycoprotein level and the Liothyronine resin uptake (T3 resin uptake) and the serum total Thyroxine Iodide (T4I) level.

INTRODUCTION

Previous investigations showed that there are alterations in the level of various glycoprotein fractions in various pathological states; such information is given in review.^{1,2,3} Recent work on the serum glycoproteins in experimental hyperthyroidism and hypothyroidism in rats and in humans with similar thyroid function disorders showed alterations in the acid glycoprotein fraction.^{2,3} This prompted us to investigate the serum alpha-1 acid glycoprotein in patients with thyroid disorders.

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MATERIAL AND METHODS

Serum samples were collected from clinically 9 euthyroid, 21 hyperthyroid and 14 hypothyroid patients. The diagnosis of euthyroid, hyperthyroid and hypothyroid conditions were made clinically and confirmed by thyroid function tests which included the T3 resin uptake and the T4I. The T3 resin uptake was determined by the method of Gimlette⁴ using Saphedex columns as supplied in kits by Ames Company. The T4I was determined by kits supplied by Ames Company. The alpha-1 acid glycoprotein was determined by radial immunodiffusion using M-Partigen plates supplied by Hoechst.

TABLE I
THE SERUM ALPHA-1 ACID GLYCOPROTEIN
VALUES (MEAN + S.D.)

Subjects	Serum alpha-1 glycoprotein mg/100 ml.
Euthyroid (9)	93.1 ± 45.5
Hyperthyroid (21)	59.4 ± 36.1
Hypothyroid (14)	67.4 ± 15.4

RESULTS

The results are shown in Table I. The values of the alpha-1 acid glycoprotein of the hyperthyroid and hypothyroid subjects were significantly lower than in the euthyroid subjects ($p < 0.05$ and < 0.025

respectively). There was no significant correlation between the respective T4I ($r = -0.15$) and the T3 resin uptake values ($r = -0.80$).

DISCUSSION

The serum alpha-1 acid glycoprotein in normal subjects in the present study (93.1 ± 45.5 mg/100 ml) closely resembles that previously reported.^{2,3}

In patients with a diffuse thyrotoxic goitre the alpha, beta and gamma glycoproteins are increased.² However, in the present study, the alpha-1 acid glycoprotein level in both the hyperthyroid and hypothyroid subjects are found to be significantly lower than that in the control euthyroid subjects. In hyperthyroidism the subjects tend to lose significant amount of weight and this is attributed to increased catabolism. As a result it is expected that the decrease in alpha-1 acid glycoprotein should be associated with an increase in serum neuramic acid level since neuramic acid is a catabolic product of glycoproteins. It has been found, unexpectedly, that the serum neuramic acid level is significantly lowered in hyperthyroid patients and increased in hypothyroid patients.² It has

been suggested that thyroid hormones affect the neuramic acid metabolism directly but not the metabolism of glycoproteins directly.² In the present study, we find that the alpha-1 acid glycoprotein level is decreased both in the hyperthyroid and hypothyroid subjects; and there is no observed significant correlation between the serum alpha-1 acid glycoprotein level and the T3 resin uptake and the serum T4I. This supports the hypothesis that the thyroid hormones does not affect the glycoproteins metabolism directly.

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