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ABSTRACT

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STUDIES IN PROTEIN METABOLISM WITH THE AID OF S^{35}-LABELED-METHIONINE *

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From the Division of Medicine, University of California Medical School, the Metabolic Research Unit, U. S. Naval Hospital-University of California, Division of Biochemistry, University of California, and the Department of Chemistry, Mills College, Oakland, Berkeley and San Francisco, California.

S^{35}-labeled-methionine has been administered to normal males and to patients with the following entities: (1) Chronic Liver Damage, (2) Idiopathic Hypoproteinemia, (3) Cushing's Syndrome. Incorporation of the labeled material in plasma protein, as well as its excretion in urine and stool, have been quantitated (in most instances as one part of protein balance studies).

The relative data in the different entities are shown in the following table:

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*** Some of this work was performed in partial fulfillment of the requirements for the degree of Master of Arts in Chemistry.

TABLE

Subject	Rate of Incorporation in Plasma Protein	Rate of Disappearance from Plasma Protein	Rate of Urinary Sulfate Excretion
Normal	1	1	1
Chronic Liver Damage	2/3	1±	Early 2 Late 1
Idiopathic Hypoproteinemia	2+	3	Early 1 Late 2
Cushing's Syndrome *	3/2	2(?)	Early 1 Late -

* Data obtained only over a 3-day period, preoperatively, as compared to studie extending over many weeks in all other subjects.

From these data, one may tentatively conclude that both the idiopathic hypoproteinemia syndrome and Cushing's syndrome are characterized by a more than normal rate of initial plasma protein formation (as evidenced by incorporation of S^{35}) followed (certainly in the former and probably in the latter) by excessive catabolism, at a rate such that net protein deficiency results.

The three patients with chronic liver damage so far studied, show a diminished rate of incorporation of the labeled material into plasma protein, and a subsequent rate of disappearance not unlike that observed in the normal.

Urinary sulfate excretion data are in excellent accord with the preceding observations.

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ABSTRACT

IS THE PROTEIN METABOLIC ABNORMALITY OF CUSHING'S SYNDROME CATABOLIC OR ANTI-ANABOLIC? *

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From the Division of Medicine, University of California Medical School and the Metabolic Research Unit, U.S. Naval Hospital-University of California Medical School, Oakland and San Francisco, California.

S^{35}-labeled-methionine in tracer dosage was administered intravenously to a 39-year old female with active Cushing's disease, referable to a large tumor of the left adrenal gland. The incorporation of S^{35} in plasma protein, tissue protein, total urinary sulfate and urinary organic sulfur was determined during the period of study.

Results show that the initial incorporation of S^{35} into the plasma proteins occurs at a more rapid rate than in the normal. In the first 48 hours there is no greater urinary excretion of organic S^{35} (S^{35}-labeled-methionine) or $S^{35}O_4$ (catabolized labeled methionine) than in the normal. These data therefore demonstrate that there is no primary anabolic defect in Cushing's Syndrome; in fact there would appear to be a hyperanabolism which does not, however, compensate for the excessive catabolism that must occur. Incorporation of S^{35} into the protein of tissues obtained at the time of operation and autopsy will be discussed as time permits.

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* This work is supported by grants from the Research Division, Bureau of Medicine and Surgery, U.S. Navy (BuMed #007046), and from the Office of Naval Research under a contract between the latter and the University of California.

** Senior Research Fellow, U.S. Public Health Service, 1947-48; and Schering Research Fellow in Endocrinology, 1948-49.