Cholesterol Metabolism

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There is much well-merited current interest in chronic degenerative diseases. As a matter of opinion, it seems entirely probable that the most important future developments in medicine will be founded upon an increase in knowledge of the basic etiologic and metabolic factors that contribute to the development of the respective pathologic states that constitute these chronic disease processes.

Even though the apparent clinical manifestations of this group of diseases are conspicuous among those individuals who constitute the older age group, there is evidence in support of the opinion that many of the chronic degenerative processes have their inception early in life. After many years of inconspicuous or undemonstrable development, they may abruptly make their unwanted presence known, and one is surprised at so sudden an appearance of such a full-grown and exceptionally well-armed and well-protected army. It is too apparent that most of these disease processes are not cured, and it is indeed a challenge to recognize that even a reasonably adequate defense is not uniformly applicable.

One of the most prevalent and important of these chronic degenerative diseases is atherosclerosis. Much is known about its pathology and its clinical result. Little is understood as to its etiology. One of the most accepted opinions is that there is some direct relationship between the metabolism of fat and the production of arteriosclerosis. Studies in this field seem to incriminate cholesterol and cholesterol metabolism as important etiologic factors. The absorption of sterols from the intestines is under normal conditions practically limited to cholesterol and irradiated ergosterol. It is well known that cholesterol is synthesized within the body. It is chiefly a product of metabolism or of body synthesis, because it is not ordinarily eaten in any quantity as such. Where and how such synthesis occurs is unknown at the present time, and the exact nature of its precursor is also poorly understood. Current evidence is in favor of the liver as the place where most cholesterol synthesis occurs, but much investigation must be made before this is clarified. It is well known that the synthesis of cholesterol takes place faster on a high fat diet than when the fat intake is low. The quantity of cholesterol produced within the body may be increased not only by eating cholesterol but also by eating any fat if the intake is sufficiently high. What the relationship is between carbohydrate, protein, and cholesterol metabolism is far from clear. Regardless of the relative quantity of calorie-producing foods that are eaten, cholesterol is continually being formed and destroyed or eliminated. Either a positive or a negative balance may be found at any given time, depending upon the experimental condition or the metabolic condition that exists.

That cholesterol is important to normal metabolism and health cannot be questioned.

* From the Department of Internal Medicine, College of Medical Evangelists.
Too frequently it is considered an enemy rather than an essential to normal metabolism. For example, it is a precursor to bile acids, a precursor to steroid hormones, a regulator of cell permeability, an insulator for axons, and perhaps has other important functions. Just why cholesterol is found within the walls of arteries in certain subjects and may be entirely absent in others is for future investigation to decide.

All indications support the assumption that cholesterol itself is not the only factor that causes arteriosclerosis. It is entirely probable that certain metabolic processes that may primarily have no direct relationship to the ingestion or synthesis of cholesterol, or even to blood cholesterol levels, may be influential in causing cholesterol to be deposited within atherosclerotic areas in arterial walls. It is obvious that before much progress can be made in the prevention or treatment of arteriosclerosis, many of these present unknowns must be investigated and solved.

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