Cholesterol: Separating the Facts from the Fiction

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As of late many patients have asked me about cholesterol and the impact of high cholesterol foods on their health. During the course of these discussions I have found that a great deal of misinformation has been spread to the public and has been accepted as truth. Myths about the nutritional values of food and the dangers of high cholesterol intake in the American diet abound. It is with the aim of dispelling some of these rather costly and themselves dangerous myths, that this article has been written.

The relationship between high cholesterol and heart disease is a topic that has drawn much attention — and created much controversy — over the last ten years. Today, low cholesterol diets and diet products can be found everywhere from supermarket shelves to doctors' offices. Television commercials urge us to eat oat bran to lower the risk of heart attacks; articles in popular magazines warn us against red meat and eggs, but encourage the consumption of breads, pastas and cereals. But have the media claims that are flooding the market really been backed up by proven scientific research? If they have, why don't they work? The number of patients we've seen this year who eat low cholesterol diets but who have high serum cholesterol levels has been absolutely tremendous. So we must pose the question: does reducing the intake of high cholesterol foods really lower the body's level of serum cholesterol in practice? This is the idea that must be thoroughly explored. In order to do this, let us take a look at what cholesterol really is.

Cholesterol is considered to be a neutral lipid compound; simply put, it is a fat. It is produced primarily by the liver, from the metabolization of acetate molecules. In turn, the breakdown of cholesterol produces a group of compounds called hormones, among which are estrogen, testosterone, Cortisol, and the like. It is found in very high concentrations in nervous system tissue and exists primarily in two forms; HDL and LDL cholesterol.

The distinction between these two different types of cholesterol is very important and often overlooked. In reality, one type of cholesterol increases the risk of heart disease and other associated ailments, while the other actually reduces it. So immediately, the assumption that the lower the cholesterol the better your health, is erroneous. LDL, or low density lipoprotein, is the actual culprit in the blockage of arteries and the high blood pressure which results from it. It attaches itself to the walls of your arteries and thereby constricts the flow of blood which would normally provide oxygen to all the organs in your body. It is the decreased oxygen flow, as well as the decreased flow of nutrients to all the tissues, which results in many different types of disease.

All this means that a person who has a balance of high HDL and low LDL is in a very low risk group for coronary disease, despite the fact that the total cholesterol level may be above normal. If your doctor orders a blood test, make sure that the cholesterol check gives you a breakdown of these two separate components. The American Heart Association recommends that an HDL level of 65 or greater be attained to reduce the risk of heart disease.

The second thing to keep in mind about cholesterol is that it is not, in and of itself, a harmful substance. In fact, it must be present in the body at a certain level to perform a number of different and, in some cases, essential functions. In the liver, for instance, cholesterol is converted into bile acids and salts which make digestion possible. Male and female sexual hormones, such as estrogen, progesterone,

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and testosterone, are all synthesized in the adrenal gland from cholesterol. Cortisol, which is the body's natural anti-inflammatory, cannot be made by the body without cholesterol (people who do not produce enough of this substance are probably all too familiar with Cortisone, a man-made drug which is supposed to mimic the action of Cortisol). The list of functions of this much maligned chemical goes on: anti-diuretic hormones, which are necessary for maintaining proper water balance, plus glucocorticoids and mineral corticoids, are all derived through complex biochemical processes from cholesterol. It is converted into Vitamin D when a person sits in the sun. And it is also necessary to produce a substance called CoQ 10, or ubiquinone, which must be present to convert dietary fats and sugars into an energy source the body can use.

And so the point to keep in mind is that cholesterol must be present in the human system at all times. The fact that a serum level which is too low can be as dangerous, though in a different way, as one which is too high, is not recognized by the millions of people who look to lower their cholesterol by drastically reducing or even eliminating high quality proteins such as eggs and beef from their diets. But through the practice we have seen definitive evidence that many kinds of symptomatology arise from these low-protein diets. In women, especially, where so many different functions depend on the proper regulation of the hormones, we have found quite a range of problems. Disturbed menstrual cycles, increased growth of facial hair, bloating, allergic responses, and lack of energy and alertness all occur when the body's cholesterol level drops below the acceptable norm. So those who embark on low-fat, low-protein, high carbohydrate diets may be compounding existing biochemical deficiencies or even creating new ones, especially when these diets are combined with strict exercise regimens.

Needless to say, there are very definitive risks which are rightly associated with a high cholesterol level. But in order for people to protect themselves against these risks, they must know precisely which kind of diet to follow; which foods will actually raise their cholesterol and which will not. In fact the kinds of foods which will create an elevated level might come as a surprise to a great many people, as will the number of ways the body can produce cholesterol all by itself. To start, let us look at one of those ways.

The major portion of the cholesterol found in the bloodstream is produced by the liver. In fact, synthesis in the liver accounts for 88% of serum cholesterol! The liver synthesizes it directly from the saturated fats consumed in a person's diet, and it is only the remaining 12% which is accounted for by the intake of high cholesterol foods. This means that a person's total level is dependent largely on how much saturated fat they consume — not on the amount of cholesterol itself. This is so because the liver changes saturated fats into cholesterol at a much higher rate than the digestive tract can absorb it. That is the first piece of information which, until now, has been largely overlooked.

In order to understand the second major way in which a person's cholesterol becomes elevated, we must talk about certain amino acids and how they are metabolized by the body. Information about amino acids, and the biochemical processes of which they are an integral part, is just beginning to filter down from the scientific community to the general public. But, as any biochemical textbook will tell you, certain amino acids produce a compound called acetates, which are directly converted into cholesterol. One of the largest culprits among these is an amino acid called histidine. It is found in some of the highest concentrations in grain products — breads, cakes, and pastas — and in all dairy products, even the low-fat types. This means that a diet high in grains and dairy will raise cholesterol levels much more quickly than one with a balance of meats like lean beef, chicken, pork, turkey — even eggs — and fruits and vegetables, with a moderate amount of wheat and dairy products.

The fact that cholesterol is produced from the intake of high histidine foods will certainly shed some light on the problem for people whose high cholesterol counts have previously been a mystery. The failure of the low-protein diets we've talked about is easily understood when

one takes into account how and from what cholesterol is actually produced by the organs of the human body. And many who have been forced to resort to cholesterol reducing drugs will be relieved to find that they can lower their levels simply and easily by consulting their health practitioner and finding the diet that is really right for them. As more research is done and more information is brought forward to the public, the health risks created by high cholesterol and the drugs needed to reduce it will surely be brought to a minimum.

The final cause of an elevated cholesterol level is the failure of the body to remove it from the bloodstream. Improper removal can occur and keep a count high despite the fact that a person eats a low fat, low cholesterol diet. This is usually caused by a low intake or deficiency in the amino acids which are necessary for the removal of cholesterol. Glycine and taurine, in particular, produce bile acids and salts from cholesterol, breaking it down and speeding its removal through the digestive tract. If these two amino acids are not present in sufficient amounts, the results can be just as dangerous as an increased intake of saturated fats. It should be noted here that fruits have a very high concentration of glycine, and can thus be said to directly aid in the reduction of cholesterol. In addition, the fruit sugar, or fructose which they contain, is converted into glycine through a number of biochemical exchanges. So one way to correct a problem with removal is to increase a person's intake of fruit — a food which is often passed over in favor of sweeter, but less nutritional snacks.

The final removal pathway we will talk about uses niacin in its active form. Niacin breaks down cholesterol from the bloodstream and uses it to produce the hormone compounds like estrogen and Cortisol which we have previously discussed. Niacin is a B vitamin which is known to have "anti-stress" properties; so if a fast-paced lifestyle depletes the body of its reserves, or if not enough of it is obtained through food (a common trap for the business person on the run), a person's cholesterol may become elevated regardless of their diet.

It should be noted that niacin does cause a dilation of blood vessels, producing a tingly or itching sensation on the skin of certain individuals.

In closing, we hope to have cleared away some of the misconceptions about cholesterol, in terms of both its importance to body function and its harmful effects, which have been so prevalent in recent years. We have looked at what cholesterol is, why its values are often misconstrued on standard blood tests, what it does, and why too little of it can be just as harmful as too much. We have also explored the many causes of high cholesterol; and mostly we have looked to direct people towards diets which conform to the metabolic laws of the body, rather than to media and even medical assumptions, which are often based on research that is narrow in scope.

In light of the fact that so much controversy does surround the reduction of cholesterol and nutrition in general, it is only fair to assume that if you have followed standard practices for reduction and have not met with success, it would be wise to look into some of the alternate methods we have described. As always, consult your health practitioner and gather as much information as you can before beginning any new diet regimen. It is crucial to remember that each person's biochemical pattern is unique, and that your dietary needs will depend on a great number of factors; genetic predisposition, stress level, and existing deficiencies are just a few. Although the truth about cholesterol has been slow to emerge from the fields of nutritional and biochemical research, advances are being made and new information is gradually coming forward. It is quite possible that in the near future, problems that seemed very complex and even untreatable will be easily solved — through individually tailored diets and the proper use of amino acids and vitamins.

References

1. Kestin M, Rouse IL, Corell RA, Nestel PJ: Cardiovascular disease risk factors in free-living men: Comparison of two prudent diets, one based on lactoovovegetarianism and the other allowing lean meat. *Am. J. Ciin. Nutr.* 50: 280-87, 1989.

2. Edington JD, Geekie M, Carter R, Benfield L, Ball M, Man J: Serum lipid response to dietary cholesterol in subjects fed a low-fat, high-fiber diet. *Am. J. Clin. Nutr.* 50:58-62, 1989.
3. Granner DK: Hormones of the Adrenal Gland. In: *Harper's Review of Biochemistry,* Martin DW Jr., Mayes PA, Rodwell VR, Granner DK, eds., California: Lange Medical Publications, 1985: 548-69.
4. Mayes PA: Metabolism of Lipids: II. Role of the Tissues. In: *Harper's Review of Biochemistry,* Martin DW Jr., Mayes PA, Rodwell VR, Granner DK, eds., California: Lange Medical Publications, 1985: 249-56.
5. Naito HK: Role of Specific Nutritional Components on Plasma Lipids, Lipoproteins and Coronary Heart Disease. In: *Nutritional Elements and Clinical Biochemistry,* Brewster MA, Naito HK, eds., New York: Plenum Press, 1980: 277-309.
6. McGilvery RW, Goldstein GW: *Biochemistry: A Functional Approach.* 3rd. ed. Philadelphia: W.B. Saunders Company, 1983: 400.
7. McGilvery RW, Goldstein GW: *Biochemistry: A Functional Approach.* 3rd. ed. Philadelphia: W.B. Saunders Company, 1983: 563-71.
8. Bhagavan NV: *Biochemistry.* 2nd ed. Philadelphia: J.B. Lippincott Company, 1978: 919-21.
9. Bhagavan NV: *Biochemistry.* 2nd ed. Philadelphia: J.B. Lippincott Company, 1978: 1225-33.
10. Knopp RH, Magee MS. Pregnancy and Parturition: Progesterone and Estrogen Formation by the Feto-Placental Unit. In: *Textbook of Physiology,* 21st ed., Patton HD, Fuchs AF, Hille B, Scher AM, Steiner R., eds. Philadelphia: W.B. Saunders Company, 1989,2:1380-89.
11. Guy ton AC: Secretory Functions of the Alimentary Tract. In: *Human Physiology and Mechanisms of Disease,* 4th ed. Guyton AC (eds.), Philadelphia: W.B. Saunders Company, 1987: 497-510.