

Salt, hypertension, and the ACE gene

Blood pressure measures how forcefully blood is pumped from the heart through the body. There are two types of blood pressure: systolic and diastolic, each with a targeted healthy range. When that healthy range is exceeded, it indicates high blood pressure or hypertension. Hypertension is often called “the silent killer” because it does not have any detectable symptoms but can lead to dangerous consequences when left untreated.

The most important dietary factor that contributes to hypertension is sodium. Normally, intake of high-sodium foods can increase risk of hypertension but this is not always the case. Some people are more sensitive to sodium while others are less so. This difference in sensitivity to sodium is largely determined by variations of the ACE gene. What this means is that sodium may have a more pronounced effect on blood pressure (and therefore risk for hypertension) if you carry specific variations of this gene.

Blood pressure is controlled by the renin-angiotensin system (RAS). The ACE gene, as well as sodium, is responsible for stimulating an increase in blood pressure through this system. There are two variants of the ACE gene in the human population: the I variant and the D variant. The I variant leads to a less active RAS system, a lower sensitivity to sodium, and a lower risk for hypertension. The D variant, which is generally considered the risk variant, leads to a more active RAS system, a higher sensitivity to sodium, and a higher risk of hypertension. Over 50% of Africans and Caucasians and about 40% of Asians carry this variant.

Sodium is one of the overabundant nutrients in the modern Western diet. The Dietary Guidelines for Americans recommends limiting sodium intake to 2.3 grams per day while the American Heart Association recommends 1.5 grams, or about a ½ a teaspoon of salt, per day. Sticking to this limit is especially important for people who carry the risk variant. GB HealthWatch provides detailed information about how to limit dietary sodium. Since potassium can cause increased excretion of sodium in the urine, increasing potassium intake is another important dietary consideration for sodium reduction. You can get an accurate evaluation of your current sodium and potassium intake by using the GB HealthWatch Diet and Nutrition Evaluator:

<http://app1.gbhealthwatch.com/healthwatch-tools-diet-evaluator.php>

In addition to sodium sensitivity and hypertension, ACE gene variants also influence muscle performance, risk for cardiovascular diseases, type 2 diabetes, obesity, dyslipidemia, and Alzheimer's disease, and response to certain medications. A more comprehensive discussion of these topics is provided in the article hypertension and the ACE gene:

<http://app1.gbhealthwatch.com/GND-Hypertension-ACE.php>