

## **Agmatine Sulfate**

Researchers have known about agmatine since 1910, but it has taken over 100 years to appreciate how much this simple nutrient can do.

### **What is Agmatine?**

Agmatine is a small molecule that the body makes naturally from arginine, an amino acid. While the total concentration of agmatine in the body is low, it shows up in concentrated pockets throughout the body. In fact, agmatine has effects on many different organs such as the kidneys, heart and blood vessels. Likewise, agmatine has many roles in health and disease, such as drug addiction, diabetes, and even cancer.<sup>1</sup> Some diseases may be linked to deficiencies in agmatine levels and activity, while performance may be enhanced by agmatine supplementation.

### **Agmatine Effects on the Kidney**

Kidney function can decrease as part of certain disease processes. Diabetes and high blood pressure are known to wreak havoc on the kidneys, for example. Moreover, kidney function declines simply as a person grows older. If left untreated, kidney disease can lead to kidney failure and may require dialysis or kidney transplant.

Recent research has revealed that agmatine has a number of beneficial effects on the kidney. Agmatine protects the kidney from injury that is caused by blood vessel disease<sup>2</sup> and by inflammatory diseases.<sup>3</sup> Agmatine also improves kidney function.<sup>4,5</sup> Specifically, agmatine increases the rate at which the kidney filters the blood.<sup>5</sup> The filtration rate of the kidney (GFR) is one of the main indicators of kidney health and function. In fact, measuring GFR is the main way that doctors determine the [health of your kidney](#).

### **A Role for Agmatine Sulfate in Type 2 Diabetes**

In type 2 diabetes, cells in the body become less sensitive to the effects of insulin. Some treatments for type 2 diabetes, like Avandia (rosiglitazone) and Actos (pioglitazone), work by increasing how cells respond to insulin. Other drugs, like glyburide and glipizide, stimulate the pancreas to secrete more insulin. Indeed, people with more advanced diabetes may need injections of insulin to treat the disease.

Amazingly, agmatine has been shown to have all three anti-diabetic effects. It sensitizes cells to the effects of insulin in at least two different ways.<sup>6</sup> Agmatine acts on the pancreas, causing it to release insulin.<sup>7,8</sup> Agmatine even acts like insulin itself on cells.<sup>9</sup> Taken together, this strongly suggests that agmatine sulfate may be a useful addition in the treatment of type 2 diabetes.

### **Agmatine Sulfate's Actions on the Heart and Blood Vessels**

Historically, agmatine generated the most interest among researchers for its ability to beneficially affect the cardiovascular system by reducing the heart rate and blood pressure.<sup>10</sup> It is important to note, however, that this blood pressure lowering effect is considered mild compared to today's blood pressure medications. In other words, agmatine only modestly decreases blood pressure and heart rate compared to prescription drugs like lisinopril and metoprolol. Nevertheless, agmatine is a natural molecule that the body produces (see Safety of Agmatine below) while prescription medications carry the risk of certain side effects.

Also, because of agmatine's effects on the kidney, the supplement may be helpful in people with congestive heart failure. Specifically, agmatine increases urinary flow and filtration. Agmatine sulfate also enhances a phenomenon called natriuresis, which is the body's way of

getting rid of excess sodium.<sup>11</sup> People with congestive heart failure must reduce their intake of fluid and salt to prevent exacerbations of their disease. Therefore, agmatine may be a useful addition to the treatment of congestive heart failure.

### **Safety of Agmatine**

Agmatine is a natural substance produced by various areas of the body. Thus, within normal circulating levels, there is no inherent danger of agmatine. Indeed, several disease states seem to be associated with abnormally low levels of agmatine in various locations in the body.<sup>1</sup>

Researchers have shown that adult rats can consume large amounts of agmatine sulfate over three months without negative effects in behavior or in their organs. The only noticeable effects were slight but significant reductions in body weight and blood pressure. While clinical trials in humans have shown that taking 3.5 grams of Agmatine sulfate each day is safe over 21 days, two researchers consumed 2.6 grams of Agmatine sulfate each day for five years and had no adverse events. Thus, agmatine sulfate is likely to be safe when taken in 2 to 3 grams doses each day for up to five years or longer in healthy individuals.

### **Conclusions**

Laboratory and clinical studies show that agmatine is a natural substance that exerts a wide array of impressive health benefits. The supplement has a number of interesting effects on the heart and kidneys. Agmatine sulfate lowers blood pressure and heart rate while helping the kidney to get rid of excess salt and fluid. This may be particularly useful in people with congestive heart failure. The supplement improves kidney function by increasing the filtration rate and protects the kidney from blood vessel disease and inflammation. In addition to protective effects on the kidney, agmatine sulfate improves insulin sensitivity, increases insulin secretion, and can act like insulin itself. These findings strongly suggest that the agmatine may be helpful in people with type 2 diabetes.

The potential benefits of Agmatine sulfate to support numerous complex systems simultaneously, combined with its low risk profile, make this compound an attractive addition to any supplementation program.

These statements have not been evaluated by the Food and Drug Administration. This product is not intended to diagnose, treat, cure, or prevent any disease.

### **References**

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