Every Powerful AMINO ACID That Affects Your Brain and Mood, Explained Transcript

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How Amino Acids Affect Your Brain and Mood

I want to talk about five of the more I want to talk about five of the more common amino acids that directly affect common amino acids that directly affect I'm Dr. A. Thank you for joining us here I'm Dr. A. Thank you for joining us here where we answer lots of questions. All where we answer lots of questions. All things health, health care, chronic things health, health care, chronic illness, cancer, and we try and break illness, cancer, and we try and break those down for you. So, to start out those down for you. So, to start out with, remember proteins break down into with, remember proteins break down into peptides. Peptides break down into amino peptides. Peptides break down into amino acids. Amino acids are used for many acids. Amino acids are used for many many things in the body, but mostly for many things in the body, but mostly for structural proteins in your body. So, we structural proteins in your body. So, we make our own proteins. Next most common make our own proteins. Next most common thing would be like enzymes. They're the thing would be like enzymes. They're the skeleton of enzymes a lot of the time.

skeleton of enzymes a lot of the time. And then they're used for other things. And then they're used for other things.

What Are Biogenic Amines?

Well, there's a group of amino acids Well, there's a group of amino acids that are also called biogenic amines. that are also called biogenic amines. And biogenic amines are simply amino And biogenic amines are simply amino acids that are also used in the acids that are also used in the neurological system, in the nervous neurological system, in the nervous system. So, I want to talk about five of system.

Tryptophan: Serotonin, Melatonin, and More

So, I want to talk about five of the many aminos that could be used the many aminos that could be used inside your nervous system and basically inside your nervous system and basically what they do. The first one, and these what they do. The first one, and these don't really go in any particular order, don't really go in any particular order, but tryptophan, or you might see a but tryptophan, or you might see a supplement called L-tryptophan, is the supplement called L-tryptophan, is the amino acid the body uses naturally to amino acid the body uses naturally to make three primary neurological make three primary neurological chemicals, but lots of other ones, too.

chemicals, but lots of other ones, too. It makes serotonin. It eventually makes It makes serotonin. It eventually makes melatonin. And it makes niacinamide, all melatonin. And it makes niacinamide, all from tryptophan. Now, you can obviously from tryptophan. Now, you can obviously get niacinamide from other ways, but get niacinamide from other ways, but there's accessory pathways for there's accessory pathways for tryptophan to make niacinamide. So, if tryptophan to make niacinamide. So, if we think about it, these are all in the we think about it, these are all in the same sort of family. We think about same sort of family. We think about serotonin. You hear about serotonin serotonin. You hear about serotonin drugs for mood regulation or depression.

drugs for mood regulation or depression. Serotonin reuptake inhibitors and other Serotonin reuptake inhibitors and other serotonin drugs like serotonin transport serotonin drugs like serotonin transport inhibitors and all the many other things inhibitors and all the many other things that they do. Well, the job of those that they do. Well, the job of those drugs is usually to keep the serotonin drugs is usually to keep the serotonin around longer. Tryptophan is your body's around longer. Tryptophan is your body's way of making its own serotonin. And in way of making its own serotonin. And in some cases, tryptophan is used as a way some cases, tryptophan is used as a way to produce more endogenous or natural to produce more endogenous or natural serotonin. Now, you might have looked at serotonin. Now, you might have looked at the supplement shelf and seen there's the supplement shelf and seen there's L-tryptophan and then 5-HTP, L-tryptophan and then 5-HTP, which is 5-hydroxytryptophan.

which is 5-hydroxytryptophan. And 5-HTP is a little more absorbable And 5-HTP is a little more absorbable form, so

the doses are usually lower for form, so the doses are usually lower for 5-HTP and tryptophan. They both feed in 5-HTP and tryptophan. They both feed in the same pathway, just in different the same pathway, just in different places. Tyrosine is number two. And places. Tyrosine is number two.

Tyrosine: Dopamine and Norepinephrine

And tyrosine directly goes downstream and tyrosine directly goes downstream and helps you make dopamine and helps you make dopamine and norepinephrine. Interestingly, tyrosine norepinephrine. Interestingly, tyrosine also helps you make thyroid hormone.

also helps you make thyroid hormone. Different pathway, but it helps you make Different pathway, but it helps you make thyroid hormone, too. So, tyrosine helps thyroid hormone, too. So, tyrosine helps you make norepinephrine dopamine, which you make norepinephrine dopamine, which are your catecholamines. These are are your catecholamines. These are generally stimulating to the body and generally stimulating to the body and they're made in a cascade. So, they're made in a cascade. So, tryptophan is the one that turns into tryptophan is the one that turns into directly L-dopa and dopamine. And then directly L-dopa and dopamine. And then dopamine can convert into dopamine can convert into norepinephrine. They're used for norepinephrine. They're used for slightly different things, but basically slightly different things, but basically norepinephrine and dopamine are norepinephrine and dopamine are stimulating neurotransmitters and they stimulating neurotransmitters and they both come from tyrosine. And as I said, both come from tyrosine.

Phenylalanine: The Upstream Catecholamine Builder

And as I said, the other one that affects your brain, the other one that affects your brain, but it's not a neurotransmitter, is but it's not a neurotransmitter, is tyrosine also helps you make thyroid tyrosine also helps you make thyroid hormone. Now, there is something above hormone. Now, there is something above tyrosine, which is our third neurogenic tyrosine, which is our third neurogenic or biogenic amine, and that is or biogenic amine, and that is phenylalanine. Phenylalanine, which is phenylalanine. Phenylalanine, which is usually sold as L-phenylalanine in the usually sold as L-phenylalanine in the supplement, goes in and can be converted supplement, goes in and can be converted to tyrosine. So, in the catecholamine to tyrosine. So, in the catecholamine generating pathways in the brain, you generating pathways in the brain, you can come in above with phenylalanine and can come in above with phenylalanine and it will get converted down to tyrosine it will get converted down to tyrosine and then dopamine and norepinephrine. Or and then dopamine and norepinephrine. Or you can come in directly with number two you can come in directly with number two we talked about, tyrosine, and go to we talked about, tyrosine, and go to dopamine norepinephrine. So, you might dopamine norepinephrine. So, you might ask yourself, well, why would people ask yourself, well, why would people bother to take phenylalanine if tyrosine bother to take phenylalanine if tyrosine is a more quick route in? Well, one is a more quick route in? Well, one reason is that there are other receptors reason is that there are other receptors that get involved and other pathways that get involved and other pathways that get involved. It's not quite as that get involved. It's not quite as simple as I'm describing it. And simple as I'm describing it. And sometimes people with chronic pain and sometimes people with chronic pain and also a need for catecholamine production also a need for catecholamine production feel less pain when they use feel less pain when they use phenylalanine as opposed to using just phenylalanine as opposed to using just tyrosine. So, that's often a clinical tyrosine. So, that's often a clinical decision that's made when we are basing decision that's made when we are basing our decision to use a particular amino our decision to use a particular amino acid to help us with catecholamines on acid to help us with catecholamines on other factors such as chronic pain and other factors such as chronic pain and things of that nature. Now, if we say things of that nature.

Best Time to Take Stimulating Amino Acids

Now, if we say that tyrosine and phenylalanine help that tyrosine and phenylalanine help make catecholamines, which are make catecholamines, which are stimulating, would you think that it stimulating, would you think that it would be good to take those more in the would be good to take those more in the morning or at night time? Obviously, the morning or at night time? Obviously, the answer is usually people do better in answer is usually people do better in the morning because if you say took a the morning because if you say took a bunch of tyrosine

or phenylalanine at bunch of tyrosine or phenylalanine at dinner, it might kick in and start to dinner, it might kick in and start to make catecholamines at night time and make catecholamines at night time and then you might wake up. So, you want to then you might wake up. So, you want to take the stimulating things like take the stimulating things like tyrosine phenylalanine usually in the tyrosine phenylalanine usually in the morning time and then you're usually morning time and then you're usually going to be okay. The next amino acid going to be okay.

Glycine: The Calming Neurotransmitter

The next amino acid that is very important and is completely that is very important and is completely on the other side of the ledger from on the other side of the ledger from catecholamines is glycine. Glycine helps catecholamines is glycine. Glycine helps to open chloride channels and that is a to open chloride channels and that is a calming neurotransmitter. The calming neurotransmitter. The interesting thing about glycine is is interesting thing about glycine is is that glycine is an unchanged that glycine is an unchanged neurotransmitter. So, a changed biogenic neurotransmitter. So, a changed biogenic amine would be tryptophan tyrosine amine would be tryptophan tyrosine phenylalanine. They have to go through phenylalanine. They have to go through all these enzyme steps to become all these enzyme steps to become activated and then become the activated and then become the neurotransmitter. Glycine, the amino neurotransmitter. Glycine, the amino acid, goes right in and works as acid, goes right in and works as glycine. There's no bioconversion glycine. There's no bioconversion needed. So, glycine is used a lot of needed. So, glycine is used a lot of times in the evening with people to help times in the evening with people to help them relax. It's kind of a sweet amino them relax. It's kind of a sweet amino acid. People put it in their sleepy time acid. People put it in their sleepy time tea and stuff like that. And the one tea and stuff like that. And the one caveat that you want to think about with caveat that you want to think about with glycine is always do a test with it glycine is always do a test with it because in about 90 plus percent of because in about 90 plus percent of humans, glycine is calming and that's humans, glycine is calming and that's its major action. It has a minor action its major action. It has a minor action that keeps your brain on an arousal that keeps your brain on an arousal state. It works in a different receptor state. It works in a different receptor complex. In about 10 to maybe 20%, but complex. In about 10 to maybe 20%, but probably 10 to 15% of humans, that probably 10 to 15% of humans, that receptor is more active than the calming receptor is more active than the calming one. So, if you've ever taken glycine one. So, if you've ever taken glycine cuz someone told you it was going to cuz someone told you it was going to help you sleep and you actually more help you sleep and you actually more awake, it's because your body is just awake, it's because your body is just naturally set to use the glycine for the naturally set to use the glycine for the more activating side of the coin and not more activating side of the coin and not the calming side of the coin. So, if the calming side of the coin. So, if that happened to you, don't take glycine that happened to you, don't take glycine to calm down. It's not going to help to calm down. It's not going to help you. The majority of people, however, you. The majority of people, however, find glycine helps them to relax and find glycine helps them to relax and sleep better, relaxes muscles, all of sleep better, relaxes muscles, all of those sorts of things. And then the last those sorts of things.

Glutamine: The Jekyll and Hyde Amino Acid

And then the last one is used elsewhere in the body and one is used elsewhere in the body and people think of it for kidney health and people think of it for kidney health and GI tract health and other stuff, but the GI tract health and other stuff, but the most high concentration, so the biggest most high concentration, so the biggest number by volume of amino acid in your number by volume of amino acid in your body is actually glutamine, L-glutamine body is actually glutamine, L-glutamine and glutamine. So, if it's the biggest and glutamine. So, if it's the biggest one in our body, it must do all sorts of one in our body, it must do all sorts of stuff and it does. It does stuff stuff and it does. It does stuff everywhere in your immune system, in everywhere in your immune system, in your kidneys as I mentioned, your GI your kidneys as I mentioned, your GI tract, in your muscles, all over the tract, in your muscles, all over the body. But in your brain, glutamine can body. But in your brain, glutamine can give rise to two different pathways. And give rise to two different pathways. And glutamine as a biogenic amine can either glutamine as a biogenic amine can either give me glutamate, glutamic acid give me glutamate, glutamic acid glutamate, which is excitatory glutamate, which is excitatory neurotransmitter. So, that's one neurotransmitter. So, that's one direction. Or it can give me GABA, direction. Or it can give me GABA, gamma-aminobutyric acid, which is a gamma-aminobutyric acid, which is a chloride channel operator just like chloride channel operator just like glycine was. And GABA is your primary glycine was. And GABA is your primary calming neurotransmitter. So, glutamine calming

neurotransmitter. So, glutamine is kind of cool in that it can go in is kind of cool in that it can go in your brain and either go one way to make your brain and either go one way to make glutamate, which is very excitatory, can glutamate, which is very excitatory, can be inflammatory, or to make GABA, which be inflammatory, or to make GABA, which is calming and will help you sleep. So, is calming and will help you sleep. So, it's it's literally like a Jekyll and it's it's literally like a Jekyll and Hyde molecule. You might ask, who makes Hyde molecule. You might ask, who makes the decision? There is a enzyme called the decision?

The GAD Enzyme, B6, and Magnesium Connection

There is a enzyme called glutamic acid decarboxylase, GAD. And glutamic acid decarboxylase, GAD. And there's different types of GAD, but the there's different types of GAD, but the one that we're talking about here takes one that we're talking about here takes your glutamine and decides is it going your glutamine and decides is it going to go over to excitatory glutamate or to go over to excitatory glutamate or down to inhibitory GABA? And the down to inhibitory GABA? And the interesting thing is is that GAD enzyme interesting thing is is that GAD enzyme is very dependent on vitamin B6 and is very dependent on vitamin B6 and magnesium in order to work. It also can magnesium in order to work. It also can be damaged through genetic issues. Some be damaged through genetic issues. Some people have hardcore genetic GAD issues people have hardcore genetic GAD issues and they get neurological problems. Some and they get neurological problems. Some people have more like snip inhibitory people have more like snip inhibitory neurological genomic problems with GAD neurological genomic problems with GAD and it just slows down on them. And what and it just slows down on them. And what will tend to happen then is instead of will tend to happen then is instead of making a balance of inhibitory and making a balance of inhibitory and excitatory, so GABA and glutamate, it excitatory, so GABA and glutamate, it just makes all glutamate and it's all just makes all glutamate and it's all excitatory. So, that's why glutamine excitatory. So, that's why glutamine sometimes gets a bad name in the sometimes gets a bad name in the neurological space. But in reality, if neurological space. But in reality, if it's balanced in the way that it's going it's balanced in the way that it's going to be used, it's going to be used in a to be used, it's going to be used in a very balanced manner. All right. Well, very balanced manner. All right. Well, there's my top five for today. Please there's my top five for today. Please check out these other videos we're going check out these other videos we're going to put up. Please do subscribe, like, to put up. Please do subscribe, like, share, do all the stuff, comment. The share, do all the stuff, comment. The community is really growing and we community is really growing and we really appreciate it. I'm Dr. A and I'll really appreciate it. I'm Dr. A and I'll