The REAL Reason NAC May Not Be Raising Your Glutathione Transcript

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What NAC Actually Does in the Body

Without cysteine in the body, the body Without cysteine in the body, the body cannot synthesize, mostly in the liver, cannot synthesize, mostly in the liver, Welcome to my YouTube channel. I'm Dr.

Welcome to my YouTube channel. I'm Dr. A. So, let's get into today's topic, A. So, let's get into today's topic, which is NAC, also known as which is NAC, also known as N-acetylcysteine, which is a common N-acetylcysteine, which is a common supplement. It's a approved drug in the supplement. It's a approved drug in the United States as well. NAC, or United States as well. NAC, or N-acetylcysteine, is an amino acid. It N-acetylcysteine, is an amino acid. It absorbs very well orally. And it is the absorbs very well orally.

Why NAC Is the Rate-Limiting Step for Glutathione

And it is the rate-limiting or main effector of our rate-limiting or main effector of our formation of glutathione. And so, a lot formation of glutathione. And so, a lot of clinicians will, and a lot of of clinicians will, and a lot of laypeople will use N-acetylcysteine to laypeople will use N-acetylcysteine to try and increase glutathione levels in try and increase glutathione levels in the body, which is great. Glutathione is the body, which is great. Glutathione is one of the three most basic and most one of the three most basic and most important antioxidants. And those three important antioxidants. And those three keep each other recycled, meaning when keep each other recycled, meaning when they're in their reduced state, they're they're in their reduced state, they're ready to be an antioxidant. When they're ready to be an antioxidant. When they're in their oxidized state, uh they have to in their oxidized state, uh they have to be reduced again. So, vitamin C, be reduced again. So, vitamin C, glutathione, and vitamin E all do this glutathione, and vitamin E all do this together and keep each other as ready together and keep each other as ready and active antioxidants. Now, when we and active antioxidants. Now, when we get to N-acetylcysteine, people say, get to N-acetylcysteine, people say, "Well, why is it more important?" "Well, why is it more important?" Because glutathione is three different Because glutathione is three different amino acids. There's glycine, there's amino acids. There's glycine, there's glutamine, and then there's cysteine.

glutamine, and then there's cysteine. So, why is cysteine, or So, why is cysteine, or N-acetylcysteine, as it's used mostly N-acetylcysteine, as it's used mostly orally and other ways, so important?

orally and other ways, so important? Well, it's because of the three amino Well, it's because of the three amino acids that make glutathione, acids that make glutathione, N-acetylcysteine is the rate-limiting N-acetylcysteine is the rate-limiting amino acid to make glutathione. What amino acid to make glutathione. What that means is that your body can have that means is that your body can have glutathione production through some glutathione production through some glycine and glutamine in the body or in glycine and glutamine in the body or in the diet. But without cysteine in the the diet. But without cysteine in the body, the body cannot synthesize mostly body, the body cannot synthesize mostly in the liver the glutathione that it in the liver the glutathione that it requires. So, when your body needs to requires. So, when your body needs to make glutathione, it will go in and it make glutathione, it will go in and it will look for these three and assemble will look for these three and assemble them through a multi-step process. The them through a multi-step process. The multi-step process can have all the multi-step process can have all the glycine and all the glutamine that it glycine and all the glutamine that it wants, but if it doesn't have enough wants, but if it doesn't have enough cysteine, it will slow down and cysteine, it will slow down and basically stop. And so, cysteine through basically stop. And so, cysteine through N-acetylcysteine supplementation can N-acetylcysteine supplementation can increase the glutathione. That's why increase the glutathione.

NAC vs Glutathione Supplementation

That's why it's so important. These three base it's so important. These three base antioxidants that protect all of our antioxidants that protect all of our cells, glutathione, vitamin C, and cells, glutathione, vitamin C, and vitamin E work

as a triplet. They work vitamin E work as a triplet. They work all together. Glutathione we make in the all together. Glutathione we make in the body, vitamin C we have to get from our body, vitamin C we have to get from our diet cuz we don't make that as humans, diet cuz we don't make that as humans, and then vitamin E we generally have to and then vitamin E we generally have to get from the diet as well. And so, when get from the diet as well. And so, when we're making glutathione, it's a little we're making glutathione, it's a little harder to make because the body has to harder to make because the body has to go through these multiple steps than go through these multiple steps than antioxidants are protective against free antioxidants are protective against free radical formation, damage to the blood radical formation, damage to the blood vessels, damage to the brain, damage to vessels, damage to the brain, damage to kidneys, all all sorts of things. That's kidneys, all all sorts of things. That's why glutathione is so important and why glutathione is so important and usually why N-acetylcysteine becomes usually why N-acetylcysteine becomes very important, especially when we're very important, especially when we're trying to raise levels of glutathione.

trying to raise levels of glutathione. Now, people will often say, "Well, is Now, people will often say, "Well, is there any research that shows, number there any research that shows, number one, it's the rate-limiting step, and one, it's the rate-limiting step, and number two, that if you give somebody number two, that if you give somebody cysteine, N-acetylcysteine, it'll cysteine, N-acetylcysteine, it'll actually raise their glutathione?" Now, actually raise their glutathione?" Now, when you're looking at N-acetylcysteine, when you're looking at N-acetylcysteine, so some people say, "Well, are there so some people say, "Well, are there pluses and minuses of just taking pluses and minuses of just taking N-acetylcysteine versus glutathione?" N-acetylcysteine versus glutathione?" There's a couple of layers you want to There's a couple of layers you want to think about. Both of them can be what think about. Both of them can be what are called mucolytic substances, which are called mucolytic substances, which is a little different than antioxidant, is a little different than antioxidant, but in uh hospital medicine, but in uh hospital medicine, N-acetylcysteine, which used to be a N-acetylcysteine, which used to be a drug called Mucomyst, could be used in a drug called Mucomyst, could be used in a ventilator system, could even be ventilator system, could even be intravenously given, but it could be intravenously given, but it could be taken orally, used in a ventilator taken orally, used in a ventilator nebulizer, and when you breathe it in, nebulizer, and when you breathe it in, it helps to break down the mucus bonds.

it helps to break down the mucus bonds. And so, it's mucolytic, it helps you to And so, it's mucolytic, it helps you to breathe better. Well, imagine if you're, breathe better.

When to Choose NAC Over Glutathione

Well, imagine if you're, you know, having asthma or you're on a you know, having asthma or you're on a ventilator and and your mucus secretions ventilator and and your mucus secretions are very sticky, that's what NAC is very are very sticky, that's what NAC is very helpful with there. Well, it turns out helpful with there. Well, it turns out glutathione is also helpful in that way, glutathione is also helpful in that way, but NAC is the standard drug approach to but NAC is the standard drug approach to that. The next thing is is that what that. The next thing is is that what does absorb of the N-acetylcysteine will does absorb of the N-acetylcysteine will help you to make more glutathione, and help you to make more glutathione, and then you have more of that triplet of then you have more of that triplet of N-A-Oxytonin working. There's also the N-A-Oxytonin working. There's also the difference in N-acetylcysteine as a difference in N-acetylcysteine as a supplement is moderately or reasonably supplement is moderately or reasonably priced. Glutathione as a supplement, priced. Glutathione as a supplement, there's two oral forms that will work.

there's two oral forms that will work. One is acetyl glutathione, and the other One is acetyl glutathione, and the other is liposomal glutathione. Those are the is liposomal glutathione. Those are the two that have research to show that two that have research to show that they're absorbed. And so, if you're they're absorbed. And so, if you're using those two, they're very good and using those two, they're very good and they get into your bloodstream, but they they get into your bloodstream, but they can be more costly than can be more costly than N-acetylcysteine. So, people will say, N-acetylcysteine. So, people will say, "Okay, well, why wouldn't I just take "Okay, well, why wouldn't I just take N-acetylcysteine boost my glutathione N-acetylcysteine boost my glutathione that way?" And the answer is, well, you that way?" And the answer is, well, you certainly can. One of the issues that certainly can.

How Genetics Affect Your NAC Response

One of the issues that can come up though is if you're using can come up though is if you're using N-acetylcysteine more for an acute N-acetylcysteine more for an acute problem, such as those respiratory problem, such as those respiratory things I was saying, sometimes what things I was saying, sometimes what we'll do is we'll just use the we'll do is we'll just use the N-acetylcysteine, and then in N-acetylcysteine, and then in maintenance, we'll move to glutathione maintenance, we'll move to glutathione with people. And then there's this other with people. And then there's this other factor, which is some people do not go factor, which is some people do not go through the multiple steps in their own through the multiple steps in their own body, in the liver mostly, to take the body, in the liver mostly, to take the three amino acids and turn them into three amino acids and turn them into glutathione. So, if you don't do that, glutathione. So, if you don't do that, why would you not do that? Well, that's why would you not do that? Well, that's because of SNPs, or single nucleotide because of SNPs, or single nucleotide polymorphisms that affect the different polymorphisms that affect the different enzyme steps in formation. And so people enzyme steps in formation. And so people can have glutathione synthetase snips can have glutathione synthetase snips and there's some other synthesis enzymes and there's some other synthesis enzymes to get the three amino acids stuck to get the three amino acids stuck together and turned into glutathione. So together and turned into glutathione. So sometimes people will have a lot of NAC sometimes people will have a lot of NAC going in the body and a very little going in the body and a very little glutathione come out the other end glutathione come out the other end because their body just is not very because their body just is not very efficient because genetically they efficient because genetically they inherited that. You can check for these inherited that. You can check for these single nucleotide polymorphisms through single nucleotide polymorphisms through nutrigenomic testing. And especially if nutrigenomic testing. And especially if you're somebody who's hypersensitive, you're somebody who's hypersensitive, maybe you have mast cell activation maybe you have mast cell activation syndromes or mast cell activation syndromes or mast cell activation disorders, multiple chemical disorders, multiple chemical sensitivity, environmental toxins, sensitivity, environmental toxins, things of that nature, it's probably things of that nature, it's probably good to look there. And the reason that good to look there. And the reason that becomes important is although the NAC is becomes important is although the NAC is good for lots of things and it's less good for lots of things and it's less costly than glutathione, if I have costly than glutathione, if I have enzyme defects in making glutathione, I enzyme defects in making glutathione, I may need to supplement glutathione may need to supplement glutathione proper and maybe use NAC just to back it proper and maybe use NAC just to back it up or for other purposes. So your up or for other purposes. So your genetics can get in the way of putting genetics can get in the way of putting those three aminos together as those three aminos together as glutathione, your central antioxidant.

glutathione, your central antioxidant.

What to Expect When Taking NAC

So a couple of things just technically So a couple of things just technically about N-acetylcysteine to consider. about N-acetylcysteine to consider. First is it smells. Smells sort of like First is it smells. Smells sort of like eggs, it's got a sulfury smell. Why?

eggs, it's got a sulfury smell. Why? It's a thiol, it's a sulfur-containing It's a thiol, it's a sulfur-containing amine or amino acid. It should have some amine or amino acid. It should have some smell, it shouldn't smell like rotten smell, it shouldn't smell like rotten eggs, but it's going to smell. The next eggs, but it's going to smell. The next thing is is that you, your urine thing is is that you, your urine certainly will have a sulfury smell to certainly will have a sulfury smell to it if you're taking any thiols like it if you're taking any thiols like N-acetylcysteine. So just that you're N-acetylcysteine. So just that you're not It's nothing wrong, it's just that's not It's nothing wrong, it's just that's the way that your urine will smell.

the way that your urine will smell. Also, if you're sweating a lot, you may Also, if you're sweating a lot, you may have a little more sulfury smell. That have a little more sulfury smell.

The Right NAC Dose for Long-Term Use

That usually is a little more diffuse than usually is a little more diffuse than the urine smell is. Now, mostly for the urine smell is. Now, mostly for people who are trying to use it people who are trying to use it chronically long-term and they're an chronically long-term and they're an adult, they're probably prescribed adult, they're probably prescribed something along the lines of a half a something along the lines of a half a gram to a gram and a half to two grams a gram to a gram and a half to two grams a day and then maybe back off to a day and then maybe back off to a maintenance level. If somebody's having maintenance level. If somebody's having a lot of respiratory disorders and a lot of respiratory disorders and problems and using a nebulizer, maybe problems and using a nebulizer, maybe gram doses for ventilator, etc. So it's gram doses for ventilator, etc. So it's a very wide index, but generally a very wide index, but generally speaking we try and dose it a little speaking we try and dose it a little higher in the beginning and then taper higher in the beginning and then taper that down for maintenance over the long that down for maintenance over the long run. So when we're thinking of it, we run. So when we're thinking of it, we need to remember that N-acetylcysteine need to remember that N-acetylcysteine is the more economical way to get is the more economical way to get cysteine in the body and produce cysteine in the body and produce glutathione. We might have troubles with glutathione. We might have troubles with our genetics, especially if we have mast our genetics, especially if we have mast cell issues or multiple chemical cell issues or multiple chemical sensitivity, environmental toxicities, sensitivity, environmental toxicities, other sensitive sensitizing sort of other sensitive sensitizing sort of issues. So it might be good to look at issues. So it might be good to look at nutrigenomics about making it and then nutrigenomics about making it and then you might need to take glutathione you might need to take glutathione proper, but basically it's a way to proper, but basically it's a way to increase your glutathione and also it increase your glutathione and also it does a few other good things like the does a few other good things like the mucolytic effect helping keep the mucolytic effect helping keep the secretions flowing, which we often use secretions flowing, which we often use it as I said both in the hospital and it as I said both in the hospital and also at home with people with colds and also at home with people with colds and flu and things of that nature. All flu and things of that nature. All