How your GUT affects PAIN and your BRAIN! Transcript

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Introduction: Brain, Pain, and the Vagus Nerve

brain and pain, what is the connection? This is a second in a series. We started last month talking about the vagus nerve because the Vagus nerve is very tied in with this.

And next month on August 16th at noon, we will be talking more specifically about all the various ways that you can activate your Vagus Nerve. But for today, we're going to focus on pain.

And the first question is, what is chronic pain and how is it different from acute pain? It's important to know this because the solutions to chronic pains lie in understanding what makes it chronic.

Acute pain we all know about, acute pain occurs because we are protecting ourselves from dangerous insults from the environment. So if you're putting your hand on a hot stove, you will automatically withdraw it because the heat tells you this is a dangerous area and I need to get my hand away from it.

And if do get burned by accident, we get all burned on the stove or the oven, It burns, you feel it, and you might get red spot, You might have a blister.

You put ice on it. It feels a little bit better. it's sore for a few days. And then as your skin heals, the pain usually goes away.

Acute vs. Chronic Pain

There are some instances where the paint doesn't go away and it may not be from a burn, it maybe from some other insult to your nerves. And when the pain persists, well after the insult, the tissue damage has happened, we call that chronic pain, especially if it's gone on for three months or more.

Some of this chronic paint becomes what we called neuropathic pain. And we're pretty sure that a lot of people with burning mouth syndrome have neuopathy pain And neuropathic pain is pain without an injury or insult.

The nerve fibers are sending pain signals to your brain without any obvious damage. I hear from people who have seen multiple practitioners, dentists, periodontists oral surgeons, ear, nose, and throat, allergy doctors who say their mouth looks fine.

Everything looks find, but yet there's pain. So there are signals going to the brain without any obvious sign of damage. Now I have to tell you with burning mouth, there may not be obvious signs of damaged, but studies have shown that tongue biopsies show a degeneration of certain types of nerves in the tongue.

This is not a biopsy that's done by your regular oral surgeon. These are bioptics that are studied research centers. So it's difficult to get a biopsy that will show nerve degeneration, but yes indeed it has been shown with burning mouth pain that there is nerve degeneration of certain types of nerve fibers in the tongue.

Still you can have neuropathic pain which is a burning, stabbing sensation, a tingling sensation. It can be a numb sensation some people have what's called allodynia which means that even a light touch I have one patient who has neuropathic pain in his feet and the sheet in this bed touching his feed is painful it's not perceived as touch his brain perceives it as pain And then there is, besides allodynia, there's pain that occurs that is much worse.

It's a painful insult, but with neuropathic pain, it is more severe than a small pain. And that's called hyperalgesia. And the real question is, how does an acute pain get turned into a chronic pain?

Neuropathic Pain and Burning Mouth Syndrome

And there are some amazing studies, and people aren't guessing, they're using MRI, magnetic resonance imaging scans, there is something called a functional MRI that can show actually what parts of your brain are lit up when you're feeling pain.

And it turns out, that with the development or transition from acute pain to chronic pain, the areas that light up in the brain are completely different.

So with acute pain, there's lighting up of certain areas, the location of the pain the intensity of pain. But then somehow the paint gets converted into chronic pain and what lights up are the emotional centers of brain.

And like I said, we're not guessing at it. It shows up on functional MRI scans. And it's possible that the gut-brain communication contributes to that what we call chronification of pain, when acute pain stops being an acute reaction and turns into a chronic, everyday, months and years on end type problem.

So how widespread is the problem of the pain? it turns out that a third of Americans have chronic pain. That's a lot. 20% of them, or around 7%, have neuropathic pain, and it's estimated in a variety of studies, anywhere from 7% to 10% percent of the entire U. S.

population has neuopathy pain 30% is caused by diabetes. because elevated blood sugars traveling in your circulatory system attack nerves and damage the nerves.

So conquering diabetes, which is definitely a nationwide issue, the diabetes rates are going up every year significantly decade by decade. it's a lifestyle issue, it a food industry issue.

It's the toxin in the environment issue it is a stress issue there are a lot of components to diabetes and our focus as a nation really should be on lowering the diabetes rates.

So a good part of neuropathic pain is caused by diabetes which we know what to do about that. So what about the other neuropathic pain that's not diabetic pain?

It turns out that there is a connection between your gut and your brain and it is very connected to pain. There are billions of microbes in your gut, even more than you have cells in you entire body.

And they consist of bacteria, fungi, protozoa, viruses, and these can regulate your nervous system. They can regularly both what we call your central nervous systems, which is your brain and your spinal cord.

and your peripheral nervous system, which is the nerves that innervate your hands, your feet, and skin.

How Pain Becomes Chronic in the Brain

That's the peripheral system. And it turns out that the microbes in the gut have input that affects nerves all over your body, whether it's central or peripheral.

How do they do it? There have been scientific studies in animal models of pain that showed that unbalanced gut bacteria, what we call dysbiosis, made them less resilient to pain.

And we see dysbiosis. We treat patients based on stool testing, where we look at a whole variety of organisms in your stool and look, do you have enough of the healthy bacteria that keeps your body on track, keeps you resilient?

lowers your pain threshold, or do you have a lot of unhealthy bacteria that are overgrowing for one reason or another? And when you a have lot unhealthy bacterial over growing, we call it dysbiosis.

Dys meaning not healthy, not good, and biosis referring to your microbiome. So dysbiosis can cause pain. And we have seen really dramatic things in regards to burning mouth syndrome with the issue of the gut-brain connection.

What's an example of burning-mouth syndrome being affected by the brain connection? We have a patient whose burning mouth syndrome was really reduced to very insignificant levels on our program.

Our basic burning-mouth program is hormones and low-dose naltrexone. She was doing really well until she needed a colonoscopy. And with the colonoscope prep and clean out, her pain came raging back.

So I investigated and learned at that time a lot about the gut pain connection. And we ended up putting her on a series of supplements and treatments that enabled her body to get restored and to find her way back to her low pain level that she had had before her colonoscopy.

I'll tell you about some of those things and how they tie in. So how did the got and the brain communicate? well it's the microbes in the gut that communicate with the brain by mediators.

So what are the mediator? Well for one thing there are what we call metabolites or neurotransmitters. GABA or gamma amino butyric acid is produced in your gut and it directs the enteric nervous system, which is how we say the gut has its own brain, it's the second brain.

Well, there are nerves all around your intestines called the Enteric Nervous System, and GABA affects that Enterric Nerve System.

Gut-Brain Communication and Dysbiosis

GAB also goes up to your brain and affects what happens in your The same thing happens with serotonin, a neurotransmitter. 95% of it is produced in the gut.

It affects the enteric nervous system. But also, by way of the vagus and the circulatory system, affects your brain. GABA and seratonin are calming neurotrasmitters.

Some of the treatments for Burning Mouth Syndrome are based on GABA's calming effect. So medications like Gabapentin and Pregabalin work on those GABa receptors.

It's important to have a microbiome that produces enough GAB and serotonin. The other neurotransmitter that's involved in this gut-brain communication or microbe- brain communication is called glutamate.

And glutamyte is an excitatory neurottransmitters. and that can worsen pain. So you want to have microbes that make plenty of GABA and serotonin and less of the glutamate.

Now glutameate is necessary, but excess glutamine is not good for nerves. It is neurotoxic. Some of these supplements that we use block glutamic receptors.

We use L-theanine a lot for anxiety and also for burning mouth syndrome because it blocks glutamate receptors, which are part of the pain-producing microbiome brain communication.

The microbes in your gut communicate with your brain and the rest of your body through immune chemical mediators. Now, before COVID, nobody ever knew what the term cytokine meant.

But since COVID you know about the cytakine storm and cytocines are immune chemicals that are very inflammatory. Now, cytokines are important for a short time to stimulate repair processes, but when cytakines and chemokine are produced unremittingly, it inflames your body, your nerves, and your brain.

An inflamed brain is a brain that doesn't function well and is more susceptible to pain. The gut-brain communication also takes place through hormones, and there are some important hormones in terms of pain.

There's one called GLP-1, glucagon-like peptide, that protects nerves. The other thing about GLp- 1 is GL p1 agonist, or medications that act like GL P1 are potent diabetes medications.

So they may also end up being something that we can use for chronic pain, but right now they are being used for diabetes and they're very potent hormones in terms of getting diabetes under control.

They go under the names of things like liraglutide and semagglutides. There also is something called neuropeptide Y. And neuro peptid Y is produced by gut microbes and communicates with your brain and neuro peptide y decreases pain.

Then of course the huge connection of the vagus nerve that facilitates a lot of communication between our gut and our brain. And how is this microbe-gut-brain connection important?

What disorders do we know are a misstep in this important communication?

Microbial Mediators: GABA, Serotonin, and Glutamate

We think that Alzheimer's is partly a misscommunicating problem between the gut and the brain. Parkinson's disease, depression, and also pain. I'm gonna spend a few minutes talking about some of the non-vegas ways that we might be able to treat pain through this gut-brain connection.

Probiotics. So our patient who's burning mouth syndrome got much worse after her colonoscopy prep. We gave a very high dose probiotic called VisBiome.

There are also important communicators called short-chain fatty acids that are produced in the gut by microbes in a gut. These short chain fatty assets are important indicators.

And one of the most important ones for the brain and gut pain connection is butyrate. So we gave this person butyrate. We also gave her acacia fiber, and acasia fiber is a fiber that whether you tend to constipation or tend kind of normalizes your stools and feeds your healthy bacteria.

So using acacia fiber will help to promote the proliferation and multiplication of healthy gut bacteria, so these are ways that manipulating what is going on with the gut can have a significant influence in pain.

The other thing that has been studied, and it's something that is not approved yet for use in pain, is fecal microbiota transplantation. And you might have heard about fecally transplantations.

It's definitely indicated for people who have a bacteria called Clostridia difficile and Clastridium difficile can overgrow in the colon and cause unremitting diarrhea.

It often happens after people have been under antibiotic treatment and can be very resistant to treatment. And a fecal microbiota transplantation will take care of it in most cases.

There is a company now that is actually making fecal capsules for use for Clostridia difficile infection. And I'm hoping that they will broaden their indications to chronic neuropathic pain.

Vitamin D ends up being really important for a proper gut function and communication with your brain. What we know is that most labs like LabCorp and Quest say anywhere between 30 and 100 for your vitamin D level.

is quote, in the normal range. 30 is way too low. So you definitely want your vitamin D up in like the 50, 60, 70, 80 range and it usually takes, if you're down at 30 or sometimes we see people at 20, it can take quite a lot of vitamin C, rather vitamin B to get your levels up to where we want them.

Inflammation, Hormones, and Pain Modulation

What we've seen with some of our burning mouth patients who have started using vitamin D upon my recommendations before they got on the rest of out program with hormones and low dose naltrexone and some the other things we do is people with very low vitamin DS in the 19 to 20 range by taking adequate amounts of vitamin

d their burning pain improves.

So that to me is a very specific confirmation that vitamin D is very important and it may be important because of the gut-brain connection and therefore the Gut-Nerve connection.

The other thing that happens with the chronification of pain is that pain goes to a completely different area of your brain when it becomes chronic. it goes to the emotional center of your brain and it gets amplified.

And studies by some of the biggest people Using, like I said, MRI, functional MRI of the brain show that the emotional center is what lights up in chronic pain, not in acute pain which was back pain of less than two months duration compared to people who had backpain of 10 years duration.

So, addressing emotional factors. And trust me, I know a lot of people with pain have been written off as it's all in your head, we can't find anything.

I'm not addressing that. That is not what I am saying. But what am I saying is we know that physiologically what's going on in the emotional center of your brain is amplifying and contributing to your pain.

And anything from early life stresses to depression to anxiety to the stress of having had a surgery affects your microbiome and therefore can affect your pain.

So a lot of what is going on now in the chronic pain psychology field is addressing the psychological issues that are holding you back from becoming resilient to pain.

Again, not saying it's all in your head, but recognizing the emotional contributor so it can be addressed so you can get pain relief. And some of the things that we refer people to to work on this aspect of pain are the curable health app, which you The Pain Management Workbook by Rachel Zofniss, which is a physical paperback workbook where you write things down about how your pain affects you and take control over what you're telling the pain and telling your primitive brain so it stops being in control of you, and in your control your of pain.

These have been very effective ways of lowering pain, in some cases, completely getting rid of the The other thing, of course, getting back to the vagus nerve, is that the Vagus nerve senses what your gut microbiota is doing, and it transfers that information to your central nervous system.

Treatments: Probiotics, Fiber, Vitamin D, and Emotional Factors

The Vagus also dampens inflammation and gut permeability, so gut inflammation, gut Gut permeability, you may not know that term, but you probably have heard of leaky gut.

And this is a condition where that one layer cell thick lining in throughout your intestine, which should each cell should be very tightly bound to the cell next to it.

The binding gets weakened and the contents inside your intestine, food particles that should never get into your bloodstream before they're completely broken down, slip through these loose junctions and get in to your bludstream and set up an inflammatory process.

Sometimes that inflammatory processes leads to autoimmunity. Sometime that inflamatory process worsens pain. It can cause any number of things, brain fog, joint pain, fatigue, there are a lot of thing, but we're focusing on pain right now.

So the vagus nerve dampens inflammation and lowers the leaky gut, lowers that permeability, and that alone modulates the composition of your microbiome.

The vagous nerve has the potential of restoring your micro biome, So I'll just mention briefly some of the ways to stimulate the vagus nerve. We'll be going into detail on this, like I said, at our next Instagram Live, which is August

16th at noon.

Meditation has been shown to… stimulate your vagous nerve, deep breathing, cold water, Putting your head or face in cold water stimulates the vagus nerve.

Singing, gargling, And using a transcutaneous vagal nerve stimulator, which is an electrical device, also stimulates your vagus nerve. And we've had some really impressive evidence of the vagial nerve stimulate's effect as far as gut motility with patients that we have who either had a damaged vagous nerve due to surgery or damaged enteric nervous system due diabetes.

and their gut slows way down. The muscles don't work, they don' squeeze food and move it along and as a result people like this have nausea, vomiting, poor absorption of nutrients, difficulty eating any amount of food.

And we have two patients who have used the vagal nerve stimulator and it's made a really big difference. So that is as far as seeing the effect of the vagus stimulation on what we call motility or movement of muscle in the gut.

Vagus Nerve Benefits and Stimulation Methods

So that's all I have to tell you about today. I want to remind you that we have a course for the public called Hope for Burning Mouth where you can learn more about a whole variety of treatments for burning mouth syndrome.

our next Instagram live next month on August 16th at noon, where I'll be joined by our health coach, functional nutritionist, Jessica Craig, and we'll going into depth on how to stimulate your vagus nerve.

So if we have any questions, I'd be happy to take them now. Can burning mouth and burning toes be associated? That's a really good question. And I mentioned one of our patients who had burning-mouth syndrome and a foot neuropathy, which wasn't so much a burning of his feet, but a stiffness of this feet.

He's the person who has alidinia, so when the sheets touch his foot, it's very uncomfortable. It doesn't just feel like a sheet touching them. So yes, its possible that there is something going on with the nerves in your body in more than one location.

And certainly everything I've said about the vagus nerve and the gut-brain connection may well apply to both of those areas of your bodies. Somebody asked if this is pertinent to psoriasis.

So, that's a good question.

Audience Questions: Burning Toes and Psoriasis

Anything pretty much that is going in on your skin, and almost all autoimmune conditions and psoriasis is an auto immune skin condition has its origin or at least part of its cause with imbalance in the gut.

So for people with skin problems that are persistent, the dermatologist will give you a topical cream to use on it, and it reduces inflammation on your skin, but it doesn't get at the underlying cause.

So what we do for any skin condition or any autoimmune condition is do a very thorough evaluation of the gut microbiome. Looking for gut inflammation, looking for the short chain fatty acids, Looking to see if you are producing enough immunoglobulins, which are fighting proteins in your gut, looking to see if you have dysbiosis.

And by correcting those things one by one, we very often help people either get rid of their skin problem or significantly diminish it. Thank you, all of you too, and thank you for your kind words of appreciation.