Galectin-3 and Kidney Damage

What's exciting from a functional medicine perspective is that we now have evidence from multiple preclinical studies showing that when you inhibit Galactin-3, you can actually reduce kidney damage.

In one such fascinating study published in American Journal of Physiology, in 2015, researchers used a pharmacological inhibitor of Galactin-3 in a model of hypertensive nephropathy, that means kidney damage caused by high blood pressure.

The results were remarkable, decreased protein in the urine, improved kidney function and reduced kidney damage. This is Doctor Talks, real talk from real doctors on the issues that matter to you most.

Did you know there is a protein in your body that might be secretly damaging your kidneys? Yet, most kidney doctors rarely discuss it with their patients.

This single protein can increase your risk of kidney failure by up to 50% when elevated. Yet, it remains largely under the radar in conventional kidney care.

So today I want to dive deep into something that many kidney doctors aren't discussing with their patients, a protein called Galactin 3 that's emerging as a key player in chronic kidney disease.

What Galectin-3 Is and Why It Matters

If you or your loved one is dealing with kidney issues, understanding Galactin 3 could be a game changer in how you approach treatment and potentially slow disease progression.

I am fascinated by Galactin 3 because it represents exactly what functional medicine is all about. identifying the underlying mechanisms driving disease rather than just managing symptoms.

In conventional kidney medicine, we often focus on controlling blood pressure, managing diabetes or prescribing medications to deal with symptoms. But what if we could target one of the actual proteins causing kidney damage in the first place?

So what exactly is galactin-3? It is a protein that belongs to a family of lectins, protein that binds to sugar molecules. Galactin-3 specifically binds to beta-galactosides, which are certain types of sugar structures found on cell surfaces and in the extracellular matrix.

That's the scaffolding that supports our cells. Under normal circumstances, Galactin-3 has important roles in the body. It helps with cell-to-cell adhesion, cell growth, and certain immune functions.

The problem arises when Galactin-3 levels become elevated, which is exactly what happens in chronic kidney disease. Recent research has shown that patients with chronic kidney disease have significantly higher levels of Galactin-3 in their blood compared to those with healthy kidneys.

What particularly is interesting is that these levels directly correlate with kidney function. The worse your kidney function, the higher your Galactin-3 levels tend to be.

This isn't just an interesting correlation, there is solid evidence that Galactin-3 is actively contributing to kidney damage through two main pathways, inflammation and fibrosis.

Let's talk about fibrosis first because it is the ultimate culprit in progressive kidney disease. Fibrosis is essentially

scarring the replacement of functional kidney tissue with non-functional fibrous tissue.

How Galectin-3 Drives Fibrosis and Inflammation

Once fibrosis sets in, those parts of kidney can't recover their normal function. This is why preventing and potentially reversing early fibrosis is so crucial.

Galectin-3 promotes fibrosis by activating cells called myofibroblasts. Think of myofibroblasts as the construction workers that build scar tissue. When Galectin-3 activates them, they start producing excessive amounts of collagen and other components of scar tissue.

A 2008 study published showed that Galectin-3 expression and secretion directly links to promotion of renal fibrosis. The second way Galectin-3 damages kidneys is through inflammation.

So Galectin-3 acts like a beacon that attracts immune cells, particularly macrophages to the kidneys. While some immune response is necessary for healing, chronic inflammation ultimately leads to tissue damage.

Galactin 3 keeps this inflammatory process going, creating a cycle of ongoing damage. What's exciting from a functional medicine perspective is that we now have evidence from multiple pre-clinical studies showing that when you inhibit Galactin 3, you can actually reduce kidney damage.

In one such fascinating study published in American Journal of Physiology, in 2015 researchers used a pharmacological inhibitor of Galactin-3 in a model of hypertensive nephropathy that means kidney damage caused by high blood pressure.

The results were remarkable. decreased protein in the urine, improved kidney function and reduced kidney damage. Even more compelling in these studies were that Galectin-3 was genetically knocked out, meaning the subjects couldn't produce this protein at all.

There was significantly less kidney pathology, including reduced inflammation and fibrosis. With that being said, I remember this patient. I worked with a woman in her early 60s with late stage 3 kidney disease related to poor years of poorly controlled hypertension.

Despite getting her blood pressure under good control, her kidney function continued to decline slowly.

Research Showing Benefits of Inhibiting Galectin-3

When we ran a comprehensive panel that included her Galectin-3, her levels were more than twice the upper limit of normal. This gave us a clear target to work on.

By implementing a protocol focused on natural Galectin-3 inhibitors, anti-inflammatory strategies and specific dietary changes, we were able to stabilize her kidney function over the next three months.

Her Galectin-3 levels dropped by about 40% and her GFR also improved during this time period. This is just one case that illustrates how targeting specific mechanisms like Galectin-3 can potentially change disease trajectories.

This brings us to the question many of you are probably asking. If Galectin-3 is so important, why isn't your doctor measuring it or talking about it?

Well, there are a few reasons for it. First, while Galectin-3 testing is available, it is not yet part of standard kidney disease panels. It is more commonly used in cardiac assessments, as it is also associated with heart failure.

Second, in conventional medicine, we tend to wait for large clinical trials before widely adopting new approaches and the research on Galectin-3 inhibition in human kidney disease is still emerging.

Third, there aren't yet every approved pharmaceutical Galactin-3 inhibitor specifically for kidney disease, although several are in development. But that doesn't mean we can't take action based on what we already know.

From a functional medicine perspective, there are several evidence-based approaches to potentially modulate Galactin-3 levels and activity. First, modified Citrus Pectin or MCP is the most well-studied natural Galactin-3 inhibitor.

A Patient Case and Why Testing Is Often Missed

MCP is derived from the peel of citrus fruits but is modified to have a lower molecular weight, so it can be absorbed into the bloodstream. Studies have shown that MCP can bind to Galactin-3 and block its activity.

The research validated dose typically ranging from 5 to 15 grams daily, but this should always be personalized based on your specific situation. Second, certain dietary polyphenols have shown galactin-3 inhibitory effects in lab studies.

These include compounds found in green tea, specially EG, curcumin from turmeric, resveratol from grapes and berries, and quercetin from apples and onions.

Incorporating these foods into your diet or considering supplements under professional guidance may be beneficial. Third, addressing underlying insulin resistance is crucial since high blood pressure and insulin levels can increase galactin-3 expression.

This means focusing on low glycemic diet, regular exercise, adequate sleep and stress management, all core functional medicine approaches. Fourth, reducing overall inflammation through our anti-inflammatory diet and lifestyle is essential as inflammation and galactin three feed into each other in a harmful cycle.

It is important to note that the kidney disease, you have to be extremely careful with the quality of supplements you take. Many supplements have unnecessary fillers and heavy metals which can be harmful to already compromised kidneys.

Beyond its role in disease progression, Gallectin 3 is also being explored as a biomarker to predict outcomes in kidney disease. A recent 2024 meta-analysis found that elevated Gallectin 3 levels are associated with higher all-cause mortality risk in chronic kidney disease patients.

Natural Ways to Lower Galectin-3

This suggests that Gallectin 3 could potentially help identify patients who need more aggressive intervention. What's particularly exciting is that research into Galectin-3 inhibitors as therapeutic agents is gaining momentum.

A 2022 review in International Journal of Molecular Sciences highlighted Galectin-3 as a promising new therapeutic target in kidney disease. Several pharmaceutical companies are developing specific galactin-3 inhibitors and some are already in clinical trials for conditions like fibrosis and cancer.

While we wait for these pharmaceutical options to become available, the functional medicine approach gives us tools to potentially modulate galactin-3 right now through evidence-based natural compounds, dietary interventions and lifestyle modifications.

Here's what I recommend if you are interested in addressing Galactin-3 as part of your kidney health strategy. Consider testing your Galactin-3 levels.

While not all doctors routinely order this test, you can request it. Normal levels are typically below 17.8, though optimal levels may be lower. If your levels are elevated, work with a physician who is knowledgeable in ways how to manage this, who understands how to build a personalized protocol for you which includes modified citrospectin and other evidence-based interventions.

Focus on anti-inflammatory, low glycemic diet, rich in polyphenols from colorful fruits and vegetables, herbs and spices. These natural compounds may help modulate galactin-3 activity.

Address underlying contributors to inflammation and fibrosis such as blood sugar, imbalances, oxidative stress, and chronic infections. Stay consistent with conventional care alongside these approaches.

Monitoring kidney function regularly is essential to track progress. I want to emphasize that every person's kidney disease has unique root causes, which is why treatment outcomes vary significantly.

Galectin-3 as a Biomarker and Future Therapy

Some patients see remarkable improvements while others experience more modest benefits. So always consult with your physician before making any changes to the treatment plan.

What excites me most about Galactin-3 research is that it represents a shift in how we think about kidney disease. moving from simply managing symptoms towards addressing the actual molecular mechanisms driving disease progression.

This is the heart of functional medicine, identifying and targeting root causes rather than just managing symptoms. The story of collecting three also illustrates why an integrative approach to kidney health is so valuable.

By combining the best of conventional medicine's diagnostic capabilities and emergency interventions, With functional medicines focused on underlying mechanisms and natural interventions, we can develop more comprehensive strategies to support kidney health and potentially slow disease progression.

As research continues to evolve, I am hopeful that Galactin-3 inhibition will become an established part of kidney disease treatment protocols. In the meantime, this knowledge gives us additional tools to potentially influence disease progression through evidence-based natural approaches.

I hope this exploration of Galactin-3 has given you a new perspective on chronic kidney disease and possible approaches to addressing it.

Practical Takeaways for Kidney Health

Remember, knowledge is power, especially when it comes to taking control of your health journey. Bye now. Thank you for tuning in to Doctor Talks. We hope today's episode has enlightened and inspired you on your path to optimal health.

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