

Perceiving Parkinson's

Synopsis - The Mysterious Origins Of Parkinson's (Day 28)

Over the past month, we've covered a lot of ground. It's time to sum up!

(1) A Brief History Of The Shaking Palsy

Parkinson's has existed alongside humanity for **at least three thousand years**, therefore whatever initiates the neuron-killing process in Parkinson's has existed since ancient times. This does not exclude the possibility that additional, "modern" factors can also initiate or speed up the progression of Parkinson's.

(2) A Disease Of Neurons, Not Brain

Parkinson's is a **disease of neurons throughout the body**, not just those in the brain. Neurons in the brain, autonomic nervous system, and enteric nervous system in the gut are all affected.

(3) The Lewy Body Enigma

Parkinson's is a neuron-killing disease **marked by neuron loss**, not Lewy body formation; it is neuron loss that produces the myriad symptoms of Parkinson's, not Lewy bodies. The role of Lewy bodies in Parkinson's is not clear - they do not always correlate with Parkinson's, and we have no idea what their role is, if any.

(4) The First Victims In Parkinson's

The first victims in Parkinson's are the **smell regions in the brain**, resulting in loss of smell years before the motor symptoms appear, and the **enteric nervous system in the gut**, resulting in constipation years before the motor symptoms appear. If the neuron-killing process starts in the smell regions then, at some point, it spreads to the rest of the brain. If the neuron-killing process starts in the enteric nervous system, it subsequently travels up the vagus nerve and creeps into the lower brainstem before spreading to the rest of the brain.

(5) The Disturbed Gut-Brain Axis In Parkinson's

There exists a reciprocal interaction between the gut microbiota and brain known as the gut-brain axis, and the gut microbiota is disturbed in Parkinson's. It logically follows that **the gut-brain axis is disturbed in Parkinson's**. Furthermore, since the gut microbiota lies in close contact with the enteric nervous system, which is one of the first victims in Parkinson's, the disturbed gut microbiota may even be involved in the initiation of Parkinson's.

(6) Mitochondria Dysfunction In Parkinson's

In Parkinson's, the mitochondria electron transport chain is damaged, resulting in impaired energy production, and the mitochondria don't undergo fusion or fission properly so they can't move around the neuron efficiently, resulting in impaired energy distribution. This **mitochondria dysfunction is a core feature of Parkinson's**. With their high energy demands and complex structural features, neurons are especially susceptible to mitochondria dysfunction.

(7) Environmental Factors In Parkinson's

It is rather striking that each of the environmental factors associated with a higher risk of Parkinson's (pesticides/herbicides and head trauma) or a lower risk of Parkinson's (smoking, coffee, and exercise) is suspected or known to **affect either the gut microbiota or the body's mitochondria**.

These are all pieces of the complex puzzle that is Parkinson's, and the **disturbed gut microbiota and mitochondria dysfunction** are particularly important problems to address. There is one more puzzle piece that we have not yet discussed - the role of **diet** in Parkinson's.

In contrast to most environmental factors, diet can affect **both** the gut microbiota **and** the body's mitochondria; diet can disturb or heal the gut microbiota, and diet can inhibit or enhance energy production by the body's mitochondria. If a disturbed gut microbiota and mitochondria dysfunction are both crucially involved in the neuron-killing process in Parkinson's, it logically follows that diet may exacerbate or hinder the progression of the neuron-killing process in Parkinson's.

On the one hand, by disturbing the gut microbiota and inhibiting the body's mitochondria, **the wrong diet could worsen the Parkinson's**.

On the other hand, by healing the gut microbiota and enhancing the body's mitochondria, **the right diet could improve the Parkinson's**.

The theory is good, but could diet really make a big difference in Parkinson's? **Nobody knows** - yet!

To answer this **burning question**, from June-August 2017 the Waikato Hospital Neurology Department will be running a randomized controlled study on the effects of diet in Parkinson's. Hopefully, some of you will be eager to join us...

Stay tuned!

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