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NATURAL APPROACHES IN PARKINSON'S DISEASE: EXPLORING CURCUMIN, GLUTATHIONE, AND COQ10

Parkinson's disease (PD) is a complex, slow, progressive neurodegenerative condition marked by tremors, rigidity, bradykinesia, and functional decline. This disease impacts about 1 million Americans, about 10 million people worldwide, and is more common to occur in men. The mechanism of this condition is from the gradual loss of dopaminergic neurons in the substantia nigra, leading to decreased dopamine signaling in pathways in the brain important for movement control. Although the hallmark motor symptoms are well recognized, PD also includes non-motor features such as cognitive decline, mood disorders, and sleep disturbances, making management challenging as the disease progresses and these symptoms worsen. While current medical treatments primarily target symptoms, there is growing interest in natural approaches that may support mitochondrial functions, reduce oxidative stress, and potentially change disease progression.

In the Terry Talks Nutrition presentation titled "Natural Approaches to Empower People with Parkinson's Disease," Dr. Jacob Teitelbaum discusses the use of natural compounds,

including curcumin, coenzyme Q10 (CoQ10), and glutathione, as promising adjunctive options for individuals with PD. His argument emphasizes antioxidant and anti-inflammatory strategies of these products, calling them "powerful tools to have in the toolbox," as a way to counteract mechanisms believed to contribute to dopaminergic neuron loss in PD.¹ While the rationale that Dr. Teitelbaum discusses behind these substances is compelling in the treatment of PD, the question remains whether current clinical evidence supports their use and proves them effective. From personally witnessing patients and people in the community with PD, it is apparent how impactful the disease state can be on their quality of life and activities of daily living, and finding a potential cure or disease reversal would be an excellent advancement in medicine for these patients. This paper critically evaluates the three highlighted supplements, curcumin, CoQ10, and glutathione, in the context of standard Parkinson's treatments and available clinical data from trials.

Before evaluating natural alternatives, it is essential to understand the current standard of care medications used for PD and the diagnosis of PD. PD is diagnosed using a combination of history of symptoms, clinical exam, neurological exam, and the use of a well-known scale Unified Parkinson's Disease Rating Scale (UPDRS). As for treatment, levodopa, in the form of carbidopa-levodopa, remains the most effective and widely used pharmacologic treatment and is considered the "gold standard" for addressing motor symptoms, as it can pass into the brain and become dopamine.² Other medications such as MAO-B inhibitors, dopamine agonists, anticholinergics, and COMT inhibitors serve as adjunctive or alternative therapies depending on symptom burden, disease stage, and patient tolerability. In later stages, deep-brain stimulation may be recommended for patients with motor fluctuations despite optimized medication therapy. All of these therapies improve function



and quality of life, but none are definitively proven to slow disease progression, and these agents may wear off in effectiveness over time. This limitation in the current treatment drives interest in natural and experimental alternatives that could potentially work in disease reversal.

In Terry Talks nutrition, it is provided that high intake of curcumin, the active ingredient of turmeric, is associated with lower brain diseases, as proven by the fact that in India, where curcumin is popular in dietary intake, they have the lowest rates of Alzheimer's and Parkinson's diseases. Dr. Teitelbaum follows this by using the support of animal studies that have proven curcumin protects against toxin-induced free radical activity and oxidative stress in the brain.¹ While looking deeper into this study, "Curcumin attenuates neurotoxicity induced by fluoride: An in vivo evidence," the work by Sharma et al. demonstrated that curcumin significantly reduces fluoride-induced neurotoxicity in mice when comparing fluoride given alone to mice versus fluoride plus curcumin.³ Exposure to fluoride increased lipid peroxidation and neurodegeneration in hippocampal regions, but when given with curcumin, there was less oxidative damage and neuronal loss, which could suggest that curcumin may help protect neural tissue. One limitation of this study was that it did not evaluate curcumin in a PD model, and was performed in an animal model, not human patients.

However, when curcumin was studied directly in patients with Parkinson's disease, the results were not as promising as hoped. In the randomized, triple-blind clinical trial, "Evaluation of curcumin as add-on therapy in patients with Parkinson's disease," conducted by Ghodsi et al., 60 patients received either nanomicelle curcumin or placebo for nine months.⁴ While the treatment with curcumin

was well tolerated, the findings failed to show statistically significant improvements in overall MDS-UPDRS or PDQ-39 scores, which measure overall symptom severity and quality of life when comparing curcumin to those who continued their usual treatment. These results suggest that although curcumin has a strong theoretical basis due to its antioxidant, anti-inflammatory, and neuroprotective effects, as stressed by Dr. Teitelbaum, its benefits in PD may not be clearly demonstrated in human studies.

The second supplement discussed in the Terry Talks Nutrition video is glutathione, an important antioxidant found in the human body. PD is one of the diseases that has been associated with inadequate glutathione when our bodies undergo oxidative stress, making it a agent of interest to treat PD potentially. Dr. Teitelbaum references a study by Dr. David Pearlmutter, that glutathione has been shown to be as effective as levodopa in reducing the symptoms of PD, all while having fewer adverse effects than levodopa and having lasting effects for as long as 4 months after the treatment is stopped.¹ He provides a video of a patient who demonstrated significant improvement in his severe PD 30 minutes after a single dose of glutathione 3000mg. Therefore, he argues that IV glutathione may be one of the most effective treatments available for PD.

However, after reviewing some published clinical trials, there was uncertainty about the complete benefits of glutathione as demonstrated in the video. In the "Randomized, double-blind, pilot evaluation of intravenous glutathione in Parkinson's disease" by Hauser et al., patients receiving IV glutathione three times weekly for four weeks showed no statistically significant improvement in Unified Parkinson's Disease Rating Scale scores when compared to placebo, even though the treatment was well tolerated.⁵ While this outcome does contrast the



claims in the video about glutathione, this was a small study that was performed, and there is a possibility of mild symptom improvement, while a larger study could possibly be performed with a more positive outcome for glutathione. An additional study evaluated was Mischley et al.'s Phase IIb intranasal glutathione trial.⁶ This trial had three months of three-times-daily dosing of intranasal glutathione, either 100 mg or 200 mg, versus placebo, found that although the high-dose group improved from baseline, neither glutathione dose demonstrated superiority over placebo, which also improved in a similar manner as the intervention groups. These results suggest that while glutathione supplementation is plausible because of its significant decrease in PD and antioxidant effects, and appears safe, the current data reviewed has not supported the strong claims made in the video regarding its effectiveness comparable to levodopa or the lasting symptom relief after discontinuation. Until larger and longer-duration studies with more power are performed with glutathione, it may be questionable how efficacious it is in benefiting PD.

The third herb that was discussed in the Terry Talks Nutrition video was coenzyme Q10 (CoQ10), which is also a powerful antioxidant that is reduced in Parkinson's patients and could potentially show benefit in PD. Dr. Teitelbaum further supports his claims by using a study that looks at CoQ10's protection against neuron death.¹ When further looking into this study, "Orally delivered water-soluble Coenzyme Q10 (Ubisol-Q10) blocks on-going neurodegeneration in rats exposed to paraquat: potential for therapeutic application in Parkinson's disease," by Muthukumaran, K et al. it was discovered that the results in this animal study did show that CoQ10 protected against neuronal cell death when given with paraquat, an herbicide linked to PD, compared

to when giving paraquat alone.⁷ In the study, Ubisol-Q10 treatment didn't start until after the paraquat exposure had already caused damage, and about 20% of the dopamine-producing neurons were lost. Once Ubisol-Q10 was introduced, the ongoing damage appeared to stop, and the remaining neurons were protected. The researchers judged improvement by looking at how many neurons survived in the substantia nigra and whether the treated animals showed better motor function which was seen with the CoQ10. Furthermore, in a study that specifically looked at patients with PD who were experiencing wearing off of their levodopa, it was also demonstrated that CoQ10 could have a positive impact on PD symptoms. This study, "Randomized, double-blind, placebo-controlled pilot trial of reduced coenzyme Q10 for Parkinson's disease," by Yoritaka et al., assessed the efficacy of ubiquinol-10 in both patients with wearing off and early PD patients without levodopa, where they either took 300 mg ubiquinol-10 or a placebo daily.⁸ This study found a decrease in UPDRS scores in the ubiquinol-10 group of those experiencing wearing off, indicating that symptoms were improved. This was the first report of proof that showed CoQ10 had a significant improvement in the wearing off. Based on these studies on the use of CoQ10, it seems that it really does have promising effects, as claimed by Dr. Teitelbaum.

Based on the information and evidence reviewed, the natural compounds discussed in the Terry Talks Nutrition presentation, curcumin, glutathione, and CoQ10, offer antioxidant and anti-inflammatory mechanisms that theoretically would be supporting of neurological health in PD. However, when comparing the claims made in the video with available evidence and clinical trials that have been done in the past, the current data remains mixed and preliminary which warrants further and larger-scale research. Curcumin has



demonstrated neuroprotective effects in animal models, but human clinical evidence has not yet shown meaningful symptom improvement. Similarly, glutathione has strong theoretical justification due to its depletion in PD, but the clinical trials available do not confirm the dramatic benefits described in the video. CoQ10 appears to be the most promising of the three described, with both animal and early human research showing potential benefit, particularly in patients experiencing medication wearing off.

Personally, as a future pharmacist, reviewing this evidence has strengthened my appreciation for both the hope and the caution required when discussing alternative natural therapies with patients. PD significantly affects daily function and quality of life, and it is understandable that individuals may seek additional options with hope when current treatments cannot slow disease progression. While the supplements presented in the video may not yet meet the threshold of strong evidence, the research surrounding them will hopefully continue to evolve, and learning about the properties these supplements have that could be beneficial was fascinating. As healthcare providers, it is important to acknowledge patients' interest in trying out products like this and remain open to upcoming data. In my opinion, these natural compounds should not replace standard levodopa therapy and other medications for PD, but may be explored as complementary options that could support patients on current PD treatment who are struggling with controlling symptoms. As research advances and more evidence is found, some of these substances may find a more meaningful place and gain popular use in PD treatment.

References:

1. Teitelbaum, J. (2023, October 5). Natural approaches to empower people with Parkinson's disease [Video]. YouTube. <https://www.youtube.com/watch?v=Ze uVIIGOXv8>
2. Mayo Clinic Staff. (2024, September 27). Parkinson's disease: Diagnosis & treatment. Mayo Clinic. <https://www.mayoclinic.org/diseases-conditions/parkinsons-disease/diagnosis-treatment/drc-20376062>
3. Sharma, C., Suhalka, P., Sukhwal, P., Jaiswal, N., & Bhatnagar, M. (2014). Curcumin attenuates neurotoxicity induced by fluoride: An in vivo evidence. *Pharmacognosy Magazine*, 10(37), 61. <https://doi.org/10.4103/0973-1296.126663>
4. Ghodsi, H., Rahimi, H. R., Aghili, S. M., Saberi, A., & Shoeibi, A. (2022). Evaluation of curcumin as add-on therapy in patients with Parkinson's disease: A pilot randomized, triple-blind, placebo-controlled trial. *Clinical Neurology and Neurosurgery*, 218, 107300. <https://doi.org/10.1016/j.clineuro.2022.107300>
5. Hauser, R. A., Lyons, K. E., McClain, T., Carter, S., & Perlmutter, D. (2009). Randomized, double-blind, pilot evaluation of intravenous glutathione in Parkinson's disease. *Movement Disorders*, 24(7), 979-983. <https://doi.org/10.1002/mds.22401>
6. Mischley, L. K., Lau, R. C., Shankland, E. G., Wilbur, T. K., & Padowski, J. M. (2017). Phase IIb Study of Intranasal Glutathione in Parkinson's Disease. *Journal of Parkinson's disease*, 7(2), 289-299. <https://doi.org/10.3233/JPD-161040>
7. Muthukumaran, K., Leahy, S., Harrison, K., Sikorska, M., Sandhu, J.



- K., Cohen, J., Keshan, C., Lopatin, D., Miller, H., Borowy-Borowski, H., Lanthier, P., Weinstock, S., & Pandey, S. (2014). Orally delivered water soluble Coenzyme Q10 (Ubisol-Q10) blocks on-going neurodegeneration in rats exposed to paraquat: potential for therapeutic application in Parkinson's disease. *BMC neuroscience*, 15, 21. <https://doi.org/10.1186/1471-2202-15-21>
8. Yoritaka, A., Kawajiri, S., Yamamoto, Y., Nakahara, T., Ando, M., Hashimoto, K., Nagase, M., Saito, Y., & Hattori, N. (2015). Randomized, double-blind, placebo-controlled pilot trial of reduced coenzyme Q10 for Parkinson's disease. *Parkinsonism & Related Disorders*, 21(8), 911-916. <https://doi.org/10.1016/j.parkreldis.2015.05.022>