Treating Parkinson's Disease Using Photobiomodulation: A Three-year Follow-up Case Series

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Parkinson's disease

Parkinson's disease (PD) is the second most common neurodegenerative disease and is growing in prevalence due to an aging population, and environmental factors such as toxins, trauma, infections and viruses (COVID), as well as other risk factors such as metabolic syndrome, type 2 diabetes and inflammatory changes in the gut and nervous system, Treatment to date has been symptomatic (dopamine replacement) which does not change the progression of the disease and has many (often serious) side effects. Improved treatment of PD would deliver considerable benefits to people with PD as well as reducing the significant cost of this disease to health systems world-wide

Photobiomodulation

Photobiomodulation (PBM) is the use of non-thermal light for therapeutic purposes. It began in the modern era with Dr Andre Mester in 1967. There are over 9000 peer reviewed articles that describe its use in tissues, animals, pre-clinical and clinical studies. It has been shown to decrease inflammation in the following diseases chronic pain, inflammatory arthritis, lymphoedema, wounds, supportive cancer care and increasingly in neurological disorders [1]. There are PBM devices that have been cleared by the FDA for reducing inflammation and increasing blood flow. PBM is now included in medical guidelines for oral mucositis, lymphoedema and supportive cancer care [2].

The **potential of PBM to treat PD** has been demonstrated in animal models (mice, rats, monkeys) and our group has recently conducted 3 proof of concept trials which has resulted in 4 publications [3-6]. Results suggested that improvements could be made in motor and and non-motor symptoms, as well as improvements in the microbiome

Clinical trial follow-up

The **Aim of this study** was to reassess several participants from the original proof-of-concept study to determine their progression in clinical signs of PD.

Methods.

PBM treatment: Participants who wished to continue the PBM treatment were supplied with a transcranial LED helmet (32x670nm diodes and 32x810nm diodes) and a SYMBYX hand-held laser (class 1, 2x904nm diodes). Participants treated themselves with the laser at home three times per week over 9 points of the abdomen and 1 point of the upper neck (3.6 joules per point, 360 joules total dose). Participants used the transcranial helmet 6 days per week. This is the SYMBYX protocol for treating symptoms of PD.

Outcome measures:

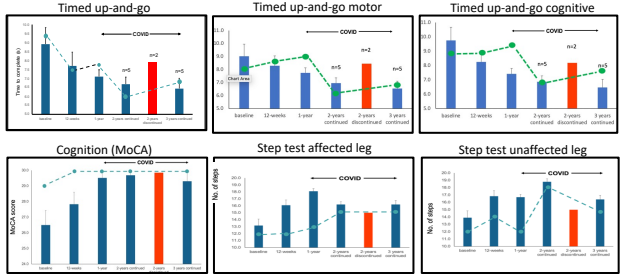
Participants were reassessed 2 years and 3 years after beginning Treatment and were assessed for

- **Gait** using a timed up-and-go test (TUG), which is the time taken to stand from a chair, walk 3m around an obstacle and return to sitting), TUG motor also done while carrying a glass of water (TUG motor) and while counting backwards by twos TUG cognitive)
- **Dynamic balance** by counting the number of times the participant could lift their leg to a 100cm platform in 15 seconds for affected and unaffected leg
- **Cognition** using the Montreal Cognitive Assessment (MoCA) with a maximum score of 30

Margaret regained her sense of smell within 12 weeks, which continued to improve over 2 years. Margaret's story can be seen on the PBM Research Foundation website
https://pbmfoundation.org/miracle-parkinsons-treatment-trials-australia/
or on the "House of Wellness"
https://www.youtube.com/watch?v=-5qZZ_qxnCo&t=30s

Results

7 participants returned for the 2-year assessment, including 2 participants who had discontinued treatment after 1-year. Results showed continued improvement for up to 3 years for those who continued with PBM treatment. The majority of participants showed outcomes above their own baseline measures, despite the treatment and assessments being performed during COVID times. This continued improvement in participants is exemplified by **Margaret (green dots)**, who also regained her sense of smell. The 2 participants who did not continue showed a decline in many outcome measures (**red**), although not cognition.



Margaret
at baseline & after 2 years

Conclusion

This study suggests that continued transcranial and remote PBM is an effective at-home treatment for the symptoms of Parkinson's disease. This study has been submitted for publication [Liebert, A., B. Bicknell, E. L. Laakso, V. Pang, G. Heller, S. Tilley, J. Mitrofanis, G. Herkes, H. Kiat (2021). "Improvements in clinical signs of Parkinson's disease using photobiomodulation: a 3-year follow-up."]

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