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The Effects of Pramipexole and Carbidopa-levodopa on Blocking Abnormal Activity in Gene LRRK2 Which Causes Loss of Dopaminergic Neurons in Parkinsons

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**INTRODUCTION**

- Parkinson’s is a neurodegenerative disorder that causes damage to dopaminergic neurons in the brain that are essential for planning and controlling body movement.
- More than 10 million people are living with this disease in the United States and there are 5,000 new cases diagnosed each year.
- Motor symptoms and non-motor symptoms.
- Pramipexole is a type of dopamine agonist that mimics dopamine effects. It was found to reduce the progressive loss of striatal dopamine neuronal function.\(^\text{2}\)
- Carbidopa-levodopa has been known to wear off because levodopa becomes less stable.\(^\text{1}\)
- One study showed that levodopa had a lower rate of neurodegeneration than the placebo group.\(^\text{3}\)

**SPECIFIC AIM**

This study aims to identify the effects of using pramipexole and carbidopa-levodopa on blocking the activity of the mutated gene LRRK2 which is known to result in the loss of dopaminergic neurons in Parkinson’s.

**LITERATURE CITED**


**POTENTIAL CONCLUSIONS**

- Higher rate of success using pramipexole.
- Higher rate of success using carbidopa-levodopa.
- Both have the same effects of treating the symptoms of Parkinson’s.
- Long term solution for treating symptoms of Parkinson’s disease.

**POTENTIAL PITFALLS**

- Higher doses of Levodopa can make patients develop Dyskinesia (abnormal involuntary movements such as head bobbing, fidgeting, swaying).
- Error in neuroimaging equipment.

**SCIENTIFIC DESIGN**

- Sample Collection
- Animal model: transgenic mice
- Control group and 3 different treatment groups
- Pramipexole
- Carbidopa-levodopa
- Both drugs

- Data Collection
- Unified Parkinson Disease Rating Scale (UPDRS)
- Dopamine transporter imaging using single-photon emission computed tomography (SPECT) with \(\beta\)-carboxymethoxy-\(\beta\)(4-idodophenyl) tropane (\(\beta\)-CIT) labeled with iodine 123
- Compare clinical severity of disease and rates of dopamine neuron degeneration.

**Figures**

- Figure 1. Neuroimaging of the Rate of Loss of Striatal \(\beta\)-CIT Uptake.\(^\text{2}\) \(\beta\)–CIT SPECT is a biomarker for striatal dopamine neuron terminals.
- Figure 2. The Total Scores on the Unified Parkinson’s Disease Rating Scale (UPDRS).\(^\text{3}\)
- Figure 3. The Progression of Loss of Neurons in Parkinson’s.