" What role does Dopamine play in Parkinson's Disease and what kind of therapies are being researched to find the cure? "

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Background

- Parkinson's Disease is a progressive neurodegenerative disease that worsens over time and degenerates the brain's amount of neurons. It targets dopamine neurons in the substania nigra and the midbrain and develops after the age of 50 years old.
- More research is needed to find ways to ether slow down the disease or find permanent, low-symptom treatments.

Research Question

What role does dopamine play in Parkinson's Disease and what kind of therapies are being researched to find the cure?

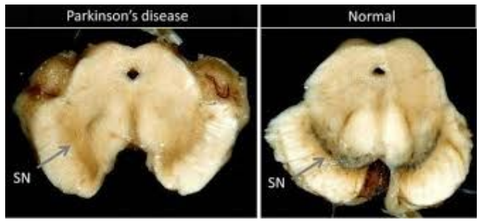
Methods

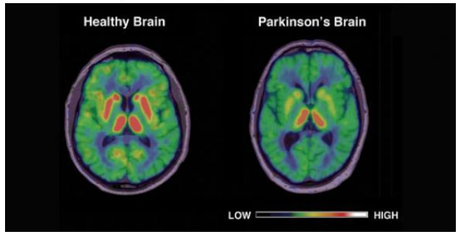
Investigating and reading multiple studies to reach conclusions and combine facts.

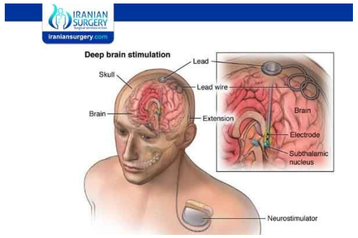
References

Findings

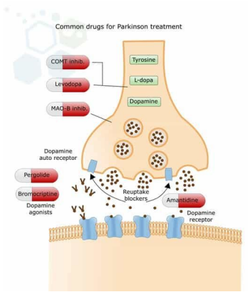
Parkinson's Disease is a neurological disorder that has been around since 1817 after being discovered by James Parkinson. Parkinson's Disease causes a low amount of dopamine in the basal ganglia. The basal ganglia and other structures are responsible for movement! One of the structures within the basal ganglia is the substantia nigra; a Parkinson's Disease patient has half of the dopamine neurons depleted. Compared to a healthy person's brain, the substania nigra is full of dopamine.We see multiple symptoms such as; shakiness, stiffness, balance problems, and slowed-down movements.Causes can be genetics and a new study has found environmental toxins (herbicides, pesticides Agent Orange chemical), triggers as one of the causes.

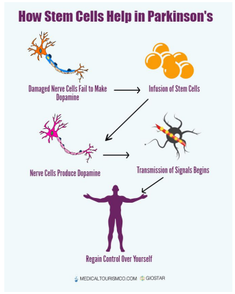


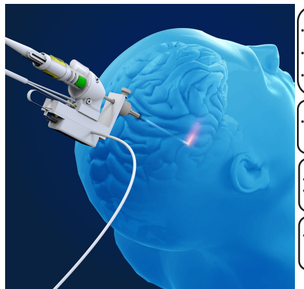




There are 4 main types of treatments: Stem Cell, Genetic Testing, Surgeries, or Prescription Drugs. Lesion Surgery is a procedure in which a certain area of the brain is targeted and that area is destroyed that has been affected by Parkinson's Disease. Deep Brain Stimulation also treats the symptoms of Parkinson's Disease, but involves inserting a deep brain stimulator; the stimulator disables the cells with electrical impulses. Transplantation Surgery is basically replacing or restoring the missing dopamine cells by implanting them into a certain part of the brain. The cells can come from the patient's body, stem cells, or human/pig embryos. Genetic Testing is used when there is a family history of Parkinson's Disease. Individuals would use this to find out the risk for any future generations and how/when to start treatment to prevent it. Stem Cells are cells that have the ability to transform and differentiate into any type of cell within the human body. The use of stem cell therapy for Parkinson's Disease is to implant the stem cells within the brain. Then they would transform into the missing cells (dopamine neurons), and restore the absent dopamine neurons within the substania nigra. While this seems like a promising therapy/treatment for Parkinson's Disease, stem cells are problematic within the medical world. The main option for treating the disease is drugs such as; Ropinirole, pramipexole, and levodopa with physical therapy.





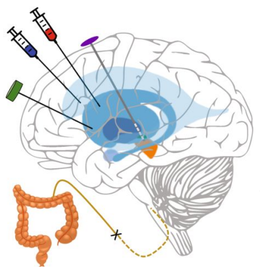


Cell Replacement Therapy
- Human fetal mesencephalic grafting
- Embryonic stem cell grafting
- Induced pluripotent stem cell grafting

Neurotrophic Factor
- GDNF (intraventricular and pump)

Deep Brain Stimulation
- Subthalamic nucleus
- Globus pallidus (interna)

Vagotomy
- Truncal



Reflections

- Early College High School
- 11th Grade
- What was your favorite TSAP moment?
- Always work ahead and ask as many questions to understand the content thoroughly.

Mentorship

- Shekinah Phillips
- Anna Sofia Crews
- It's perfectly fine to not know your end goal, this is your time to learn and experience new things.

Acknowledgement

This work was supported in part by NIH grant 1R25GM142048-01