CALIFORNIA SCIENCE & ENGINEERING FAIR
2018 PROJECT SUMMARY

Name(s)

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Project Number

38708

Project Title

Exploring the Efficiency of Neuroplasticity on the Concentration Levels and Memory of ADHD Patients

Abstract

Objectives/Goals

Attention Deficit Hyperactivity Disorder causes the patient to struggle to focus and have a low attention span. The drugs that are the primary treatment, are highly addictive and may cause addiction. We sought to use Neuroplasticity that states the brain can rewire/adjust itself to solve the given situation. We attempted to train the brain's electrical flow to work together rather than "flying" everywhere; which was our attempt to a non-drug treatment.

Methods/Materials

60 potential ADHD subjects were evaluated to end up with 30 similarly controlled subjects. A wooden plaque with three colored cubes was created to serve as a cognitive training and the app BrainTap was installed to an electric device. Two types of testing were conducted. For the first test, training was done on the plaque and on device; and data was gathered by accuracy. For test 2, training was performed and data was collected by the accuracy of a quiz.

Results

The average score of Test 1 was 8.9 and the average of test 2 was 8.07 and difference of the averages was 0.83. A T-test was done to find a variance point of 2.821. 2 hypotheses were created, Null hypothesis, Ho, and Ha hypothesis, alternate hypothesis. The null hypothesis stated that the data points collected, will have a significance difference. Ha states that there isn't a significant difference. We failed to reject our null hypothesis by finding the P-value from the table. Meaning that there is a major difference between the points. Mathematically, Alfa (variable for the difference of averages, 2.821) was less than our P-value. To further secure our results, we did a confidence interval test. We found a 90% confidence in our results which means that cognitive training may be a treatment for ADHD patients.

Conclusions/Discussion

Our hypothesis was supported by our results that had a 90% accuracy. We infer that the both of training made our subjects think, be patient, and focus on the task in from of them. We believe the brain reacted to the training as something interesting and engaging. The frontal lobe, temporal lobe, hippocampus, and the basal ganglia were all working together to process the new information which were presented in both methods and worked together; which is crucial information as it suggests our hypothesis that cognitive training gives a boost to attention span in ADHD patients as it would with drugs/stimulants.

Summary Statement

We contrived this study to show that Neuroplasticity is an effective and has the potential to be a non-drug treatment of ADHD.

Help Received

We contacted several doctors to end up Dr. Anita Hamilton of CHLA and Mr. James Le Bouf who both helped us evaluate the potential subjects. Our advisor, Rob Ickes helped develop out idea and looked over our data for errors.

Preliminary