Metabolomic and Exposomic Networks in ALS
September 2020

OVERVIEW

Dr. Robert K. Naviaux, MD, PhD at the University of California, San Diego (UCSD) and his collaborators, Dr. Robert M. Pascuzzi, MD at Indiana University, and Dr. Keith L. March MD, PhD at the University of Florida, are studying the role of metabolism and environmental chemicals in amyotrophic lateral sclerosis (ALS). This first study will focus on the most common form of ALS in males ages 50-85 years. We will also be enrolling an equal number of healthy controls. Information about this study can be found online at:
https://naviauxlab.ucsd.edu/science-item/als/.

The results of this study are experimental and will not be used in any way to help in clinical diagnosis or treatment. There will not be any direct benefit to participants from these procedures. However, the investigators may learn more about the metabolic and environmental factors associated with ALS.

DESIGN

In this study, we will collect 4 blood samples from each person over a period of 1-2 months. Participants will also be asked to complete six questionnaires at their convenience over the same time period. The aim of this research will be to see if a blood test might eventually be used to help with the diagnosis and prognosis of ALS. In addition, the study will measure 1200 different environmental chemicals that can be detected in the blood to see if any of these might contribute to the cause or worsen the severity of ALS.

ENROLLMENT GOALS

We hope to enroll 15 patients with ALS and 15 healthy controls each year for the next two years.

ENROLLMENT CRITERIA

A. **ALS Subjects**
- a. Inclusion Criteria
  - i. Meet El Escorial World Federation of Neurology criteria for probable or definite ALS[1]
  - ii. Males between the ages of 50-85 years old
- b. Exclusion Criteria
  - i. Symptoms of ALS for more than 5 years (slowly-progressing forms of ALS will be studied in a later study)
  - ii. Hospitalization for any reason in the past 6 weeks
  - iii. Ventilator dependent (non-invasive mechanical ventilation at night is ok)
  - iv. Unable to give signed informed consent
  - v. Unable to complete a series of 4 blood draws over 1-2 months
  - vi. Unable to complete 6 questionnaires about health and quality of life

B. **Healthy Controls**
- a. Inclusion Criteria
  - i. Healthy males between the ages of 50-85 years old
- b. Exclusion Criteria
  - i. Hospitalization for any reason in the past 3 months

      ii.   Any chronic brain or spinal cord disorder
     iii.   Taking prescription medication for three or more (≥3) chronic health diagnoses
     iv.   Unwilling or unable to complete 4 blood draws and 6 questionnaires

REGULATORY ASSURANCES

This work will be performed with signed informed consent as part of Dr. Naviaux's IRB-approved protocol #140072, "The UCSD Metabolomics Study". This study will also be approved by the IRB of each participating clinical center.

METHODS

Four ml (0.8 teaspoons) of blood will be collected in a green-top lithium-heparin coated vacutainer tube. The tube will be mixed by gentle inversion 10 times then centrifuged within 1 hour of collection. The separated plasma will be transferred to fresh tubes with patient name, date, time, and "Naviaux Study" on the label, and stored at -80˚C until shipped for analysis. The plasma samples will be used for metabolomic and exposomic analysis using published methods[2, 3].

A second tube of 2.5 ml (0.5 teaspoons) will be collected into a PAXGene tube that contains 6.9 ml of preservative. Tubes will be labeled with patient name, the date, time, and "Naviaux Study". After collection, the tube will be gently inverted 10 times then stored at -80˚C until shipped for analysis. This blood sample will be used for microRNA analysis[4, 5].

REFERENCES

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