PHACS AMP
Participant Summary

Title: Mitochondrial Function and Metabolic Abnormalities in Children with Perinatally-Aquired HIV Infection in the Pediatric HIV/AIDS Cohort Study (PHACS)

Authors: Tracie L. Miller MD, Jiajia Wang MS, Denise L. Jacobson PhD, MPH, Jody K. Takemoto PhD, Tanvi Sharma MD, Mitchell E. Geffner MD, Daniel E. Libutti BS, Suzanne Siminski MS, MBA, Laurie Dooley MT, MBA, Gabriel Somarriba DPT, Patricia Graham MS, and Mariana Gerschenson, PhD

Study Description: Problems with mitochondria can cause diabetes and heart problems that are common in HIV-infected (HIV+) youth. Mitochondria are a part of the cell that helps generate power for the body. The problems of the mitochondria can be caused by HIV or the medicines used to treat HIV. We compared how the mitochondria work in youth with and without HIV. We also looked at problems with the mitochondria to see if they are associated with diabetes risk such as high blood sugar and high insulin levels. We looked to see how race, obesity, CD4, HIV virus levels and diabetes tests were associated with how well the mitochondria worked.

Study Population: Both HIV+ and non-infected (HIV-) youth were enrolled from the PHACS Adolescent Master Protocol (AMP). So far, we have enrolled 112 HIV+ youth and 66 HIV- youth. The HIV+ youth were on average 15.8 years and the HIV- youth were 12.4 years old.

Results: Obesity was not as common in the HIV+ youth. Most of the HIV+ youth were healthy with almost 2/3 of them having very low HIV virus. The blood sugar level was fairly normal, but some of the insulin levels were high in the HIV+ youth. Insulin is a hormone that helps keep blood sugar normal. A youth may start to develop diabetes if insulin is high. One measure of how well mitochondria work (called lactate) was higher in HIV+ youth. Other measures of how well mitochondria work were similar between the two groups. We found that blood sugar was higher when mitochondria were not working as well as they should.

Conclusion: This study shows that mitochondria, the power house of the body, can affect diabetes risk. Also, it suggests that some medicines used to treat HIV, or even the HIV virus itself, can possibly make mitochondria not work as well. We continue to study this problem, and this information right now is preliminary.

Support: This study was supported by NICHD with co-funding from NIDA, NIAID, OAR, NIMH, NINDS, NIDCD, NHLBI, NIDCR, and NIAAA.