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Award Number: DAMD17-03-2-0024

TITLE: Physiologic and Endocrine Correlates of Overweight and Obesity in African Americans and Caucasians

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Rockville, Maryland 20852

REPORT DATE: March 2004

TYPE OF REPORT: Annual

PREPARED FOR: U.S. Army Medical Research and Materiel Command
Fort Detrick, Maryland 21702-5012

REPORT DOCUMENTATION PAGE

Form Approved
OMB No. 074-0188

1. AGENCY USE ONLY (Leave blank)	2. REPORT DATE	3. REPORT TYPE AND DATES COVERED
	March 2004	Annual (1 Mar 03-29 Feb 04)

4. TITLE AND SUBTITLE
Physiologic and Endocrine Correlates of Overweight and Obesity in African Americans and Caucasians

5. FUNDING NUMBERS
DAMD17-03-2-0024

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8. PERFORMING ORGANIZATION REPORT NUMBER

9. SPONSORING / MONITORING AGENCY NAME(S) AND ADDRESS(ES)
U.S. Army Medical Research and Materiel Command
Fort Detrick, Maryland 21702-5012

10. SPONSORING / MONITORING AGENCY REPORT NUMBER

11. SUPPLEMENTARY NOTES

12a. DISTRIBUTION / AVAILABILITY STATEMENT
Approved for Public Release; Distribution Unlimited

12b. DISTRIBUTION CODE

13. ABSTRACT (Maximum 200 Words)

Obesity has reached epidemic levels and yet the incidence continues to rise. The current study is seeking to examine the hypothesis that obesity may reflect dysfunctioning of the hypothalamic-pituitary-adrenal (HPA) axis in response to stressors. African American persons are at greatest risk, but reasons for this difference are unknown. We will study 120 men and women of Caucasian and African American ethnicity and examine their responses to physiologic stressors: exercise and ingestion of a meal. **Methods:** The HPA axis will be studied in some detail by using two stressor paradigms and two steroid regimens. We expect to be able to detect subtle differences in HPA axis reactivity in obese individuals and that might contribute to morbidity and perhaps even make individuals resistant to therapeutic interventions. **Results:** We have enrolled 21 participants, with 7 completed without seeming difficulty, and data collection is proceeding on schedule. Participants are also completing the exercise stress test, in spite of not being used to exercise, in general. **Conclusions:** We anticipate being able to complete this study as planned without difficulty and look forward to being able to answer the important questions regarding the potential role of the HPA axis in obesity.

14. SUBJECT TERMS
Obesity, insulin sensitivity, glucocorticoids, metabolic syndrome, African Americans, Caucasians, exercise, meal feeding

15. NUMBER OF PAGES
6

16. PRICE CODE

17. SECURITY CLASSIFICATION OF REPORT	18. SECURITY CLASSIFICATION OF THIS PAGE	19. SECURITY CLASSIFICATION OF ABSTRACT	20. LIMITATION OF ABSTRACT
Unclassified	Unclassified	Unclassified	Unlimited

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Introduction

Obesity has reached epidemic levels and the incidence continues to rise. The current study is examining the hypothesis that obesity may reflect dysfunction of the hypothalamic-pituitary-adrenal (HPA) axis in response to stressors. African American persons are at greatest risk for obesity, but reasons for this difference are unknown. We will study 120 men and women of Caucasian and African American ethnicity and examine their responses to physiologic stressors: exercise and ingestion of a meal.

Body

Year One:

1. *Ensure that all technical aspects of project are identified and key personnel are aware of expectations and roles by having regular meetings until experiments are underway.*

Multiple meetings have occurred between the PI and the Co-investigators on a regular basis and also with the Project Coordinator and other staff prior to initiating the study. Many of the initial meetings focused on human participant issues, but subsequent meetings have focused on details, logistics, advertising, promotional materials, recruitment, timelines, and more recently updates on issues related to recruitment and participant completion.

2. *Prepare notebook of standard operating procedures.*

A Manual of Operating Procedures, or MOOP, that contains all aspects of the study, including a Signature Sheet, Memos to and from the Office of Research, IRB approvals, Study Protocol, Time and Events Tables, Study Staffing Roster, Screening Form, Pre-Brief, Adds, Informed Consent, Randomization Sheets, Timelines, Max Protocol, Blood Schedule, Adverse Events Paperwork, Data Management, Study Forms, Questionnaires, Standard Operating Procedures, and Medical Sheets, was prepared and is updated on a regular basis as needed.

3. *Recruit a postdoctoral fellow.*

A postdoctoral fellow has been recruited and will come on board this July.

4. *Train all personnel in human use, data management, procedural issues.*

Erin Sutton, the Research Coordinator for the study was trained and began training other personnel when they were hired in July. All personnel completed the online **CITI Program in the Protection of Human Research Subjects,** laboratory safety training, and blood borne pathogens training. In addition databases for the research data and any adverse events were developed at the beginning of the study. In January, a Research Associate who has excellent database skills was hired and she will ensure the data are entered in a timely fashion. Safety procedures were recently reviewed and updated and all personnel recertified in Basic Life Support. We have regular training on emergency procedures and are always attentive to participant safety. Overall, we are very secure in these areas and believe we have a solid foundation for conducting this research.

5. *Order supplies and other biochemical reagents required for initiating the study.*

All exercise testing and meal feeding supplies were ordered and biochemical supplies for the primary assays have been identified and are being tested. Most recently we ordered software for scanning our questionnaires. We have begun our biochemical

assays so those types of reagents are ordered on an "as needed" basis.

6. *Recruit/Screen/Test 10 Overweight/Obese and 10 Non-obese subjects.*

We are extremely pleased with our recruitment and testing progress. Due to delays in IRB approval, we were unable to even begin recruiting until October, so we have only been testing for five months. Below is a table that breaks down our current recruitment efforts by weight category as a function of screening, enrollment, in progress, and completion.

	Overweight/Obese	Non-Obese	Total
Screened	24	15	**39**
Recruited/Enrolled	15	6	**21**
In Progress	8	6	**14**
Complete	7	0	**7**

Key Research Accomplishments

- Submitted information for Institutional Review Board (IRB) Approval in December 2002
- Obtained IRB Approval from USUHS IRB in July 2003.
- Developed Manual of Operating Procedures
- Obtained final IRB approval from Army and USU in October 2003
- Informed Consent Document was approved on 1 October 2003.
- Began recruiting volunteers in October 2003
- Screened 39 interested persons
- Prepared abstract for April meeting
- Enrolled 21 participants
- Completed testing 7 participants
- Started biochemical assays for completed participants

Reportable Outcomes

None to date

Conclusions

African Americans have the highest coronary heart disease mortality of any ethnic group in the United States, and African-American women have the highest prevalence of the Metabolic Syndrome. This phenomenon is primarily attributable to the high prevalence of hypertension, obesity, and diabetes in African Americans. In a recent survey of urban African-American women, participants were recruited for coronary heart disease risk factor screening from 20 churches, with the screening including demographic, smoking and medical history assessment, and measurements of weight, height, waist circumference, blood pressure, lipid levels, and glucose. Of the total of 396 women studied, only 16% were of normal weight, with 29% overweight and 55% obese. CHD risk factors increased linearly with increases in body mass index. The treatment of

these cardiovascular risk factors consists of modifying or reversing the root causes and directs treatment of the risk factors.

To date, the root causes are not certain, yet the main treatment strategies involve weight reduction and increased physical activity. Whether these interventions will improve the risk factors in AA persons is unknown, but the current proposal will allow us to examine and compare the role of stress in the development of both overweightness and glucose intolerance in an AA sample as compared to a Caucasian sample. The current study is designed to examine differences between Caucasians and African Americans in terms of potential underlying causes of metabolic syndrome, and how different physiologic stressors activate the hypothalamic-pituitary adrenal axis and metabolic processes intrinsic to obesity and associated CHD risk factors.

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Appendices

None