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In Search of Susceptibility Genes for Type 2 Diabetes in West Africa: The Design and Results of the First Phase of the AADM Study

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Abstract

PURPOSE: The purpose of this study is to map type 2 diabetes susceptibility genes in West African ancestral populations of African-Americans, through an international collaboration between West African and US investigators.

DESIGN AND METHODS: Affected sib-pairs (ASP) along with unaffected spouse controls are being enrolled and examined in West Africa, with two sites established in Ghana (Accra and Kumasi) and three in Nigeria (Enugu, Ibadan, and Lagos). Eligible participants are invited to study clinics to obtain detailed epidemiologic, family, and medical history information. Blood samples are drawn from each participant to measure glucose, insulin, C-peptide, total cholesterol, LDL, HDL, triglycerides, albumin, creatinine, urea, uric acid, total calcium and to detect autoantibodies to glutamic acid decarboxylase (GAD). DNA is isolated from frozen white blood cells obtained from 20 ml of EDTA whole blood samples.

RESULTS: With full informed consent, 162 individuals from 78 families have been enrolled and examined since the Africa America Diabetes Mellitus (AADM) study began in June of 1997. Logistics of field examinations and specimen shipping have been successfully established. At the end of the third year of field activity (September 2000) the AADM study will have enrolled and performed comprehensive examination on 400 ASP with type 2 diabetes, for a minimum of 800 cases and 200 controls from Ghana and Nigeria. At the current participation rate, the goal of 400 sib-pairs and 200 controls will be met before the scheduled closing date.

CONCLUSIONS: The AADM study will create a comprehensive epidemiologic and genetic resource that will facilitate a powerful genome-wide search for West African susceptibility genes to type 2 diabetes.

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Keywords

Genes; Type 2 Diabetes; West Africa; Sib-Pairs; Linkage

Abbreviations

NHANES III = National Health and Nutrition Examination Survey 1984–1994; OGTT = oral glucose tolerance test; MODY = maturity-onset diabetes of the young; NHGRI = National Human Genome Research Institute; ORMH = Office of Research on Minority Health; AADM = Africa America Diabetes Mellitus Study; ASP = affected sib-pair; ADA = American Diabetes Association; FPG = fasting plasma glucose; GAD = glutamic acid decarboxylase; GAD-65-Ab = glutamic acid decarboxylase-65 antibodies; BIA = bioelectrical impedance analyzer; SPA = Single Project Assurance; DERC = Diabetes Endocrinology Research Center; IDDM = insulin-dependent diabetes mellitus; HDL = high density lipoprotein; LDL = low density lipoprotein; VLDL = very low density lipoprotein

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