Kumasi Diabetes and Hypertension Study

The Kumasi Diabetes and Hypertension (KDH) Study was conducted as an unmatched case-control study at the largest hospital in Ghana: Komfo Anokye Teaching Hospital, Kumasi (Fig. 1).

It was financially supported by the Sonnenfeld Foundation, Berlin and by the Charité, Berlin (grant no. 89539150). In this project, our group collaborates with the Kwame Nkrumah University of Science and Technology, Kumasi and the Institute of Tropical Medicine and International Health, Charité – Universitätsmedizin Berlin. The aims of the KDH Study are the characterization of patients with type 2 diabetes and hypertension, and the identification of genetic and non-genetic risk factors of type 2 diabetes and hypertension in this urban sub-Saharan African population (Danquah et al. 2012).

Recruitment procedures

Between August 2007 and June 2008, 1,466 participants were recruited in the diabetes center (n = 495), the hypertension clinic (n = 451), among outpatients (n = 150), hospital staff (n = 148), and neighbors of the diabetes and hypertension patients (n = 222). After an overnight fast, biological samples were collected, physical examinations were performed, and questionnaire-based interviews were conducted. Type 2 diabetes was defined as fasting plasma glucose ≥7.0 mmol/L or documented anti-diabetic medication, while hypertension was defined as mean blood pressure ≥140/90 mmHg or documented anti-hypertensive treatment.

Assessments and laboratory examinations

According to standardized operating procedures, each participant underwent the following assessments. We collected fasting venous blood samples and morning urine. The study physician performed physical examinations. Blood pressure was measured in triplicates. Anthropometric measurements were taken and body composition was determined by bioelectric impedance analysis. Trained study personnel conducted questionnaire-based interviews in the local language to document the demographic data, socio-economic characteristics, medical history, smoking behavior, and physical activity. Habitual dietary intake was assessed by means of a culture-specific food frequency questionnaire. Concentrations of fasting plasma glucose, hemoglobin, plasma hemoglobin, and urinary albumin were
measured using a hand-held photometer. We also analyzed the serum lipid profile, the serum phospholipid fatty acid profile (28 fatty acids), biomarkers of vitamin A metabolism and iron status, inflammatory markers, and adipokines.

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