Objective: To outline the study design of the Multicultural Community Health Assessment Trial (M-CHAT). The purpose of the study is to compare the relationship between visceral adipose tissue (VAT) and total body fat in men and women of Aboriginal, Chinese, and South Asian origin with a similar group of men and women of European origin.

Design: A total of 200 apparently healthy men and women between the ages of 30 and 65 will be recruited from each of the local Aboriginal, Chinese, and South Asian communities. Within each sex/ethnic group, an equal representation of participants will have a body mass index between 18.5 to 24.9, 25 to 29.9 and ≥30. Each participant will undergo an assessment for VAT, total body fat, metabolic risk factors, physical activity, diet, quality of life, and sociodemographics.

Main Outcome Measures: The primary outcome of this study is the relationship between VAT and total body fat in each of the Aboriginal, Chinese, and South Asian cohorts; this relationship will be compared to the European cohort after adjustment for age, sex, socioeconomic status, smoking status, physical activity, diet, and body mass index.

Conclusions: This study will be the first to identify differences in body fat distribution in these populations. We anticipate that in populations of Aboriginal, Chinese, and South Asian origin, a greater proportion of total body fat will be deposited as VAT compared to those of European origin. (Ethn Dis. 2006;16:96–100)

Key Words: Aboriginal, Body Fat Distribution, Chinese, Ethnicity, South Asian, Visceral Adipose Tissue

INTRODUCTION

The prevalence of obesity is increasing in all populations and age groups such that the World Health Organization describes it as a global epidemic. Several clinical measures, such as body mass index (BMI) and waist circumference (WC), are used to identify patients at increased risk for obesity. However, norms for these measures are based on studies of predominantly Caucasian and European populations, despite evidence to suggest that these norms may not apply to those of non-European origin.

Historically, populations from Asia, such as the Chinese and South Asian populations, as well as Aboriginals in North America, have not had high prevalence rates of obesity, but in recent decades, this prevalence has increased coincident with a “Westernization” of their lifestyle and environment. In China, the prevalences of overweight (BMI 25–29.9 kg/m²) and obesity (BMI ≥30 kg/m²) have significantly increased over the past two decades and were estimated in the late 1990s at 21.5% and 2.9%, respectively. In India the prevalence of obesity ranges from 7.0% to 13.3% in men and 15.6% to 23.7% in women, depending on the study. In addition, Chinese and South Asian populations living in Western countries have higher BMI levels than in their originating countries. The prevalence of obesity in North American Aboriginal populations has been reported between 44% to 62% in various studies, which is nearly double that of matched Caucasian populations.

While these populations suffer from the same obesity-related morbidities and mortalities as European populations, recent evidence suggests that the level at which health is compromised based on measures of BMI or WC is lower than that of Caucasian populations. A number of studies have reported that those of Chinese or South Asian origin have an increased percent body fat and risk factors for cardiovascular disease (CVD) compared to similar European populations at the same BMI or WC. In Aboriginal populations, susceptibility to obesity is higher, in particular abdominal obesity, which coincides with an increased prevalence of diabetes. These reports suggest that body fat accumulation and distribution may differ between ethnic groups and has led to a call for population-specific anthropometric targets.

Investigations comparing men and women of European and African-American descent suggest that the distribution of body fat may depend on ethnic background. These well-conducted studies found that African-American men and women had significantly less visceral adipose tissue (VAT) after correction for total body fat compared to men and women of European descent. Studies in Aboriginal, Chinese, and South Asian populations investigating VAT body fat distribution are limited. These reports are inconclusive because of small sample sizes and poor methods. One such study did report a greater amount of VAT (corrected for total body fat) in Korean women (n=18) compared to European women (n=36) but not in men. To date no study has been conducted with the rigor and sample size to conclusively establish the significance of these findings.