Prevalence of Risk Factors for Coronary Heart Disease Among Dominicans in the Dominican Republic: Comparison with Japanese and Americans Using Existing Data.

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Risk factors of coronary heart disease (CHD) in Dominicans were compared with those of Japanese and Americans for the presumption of prevalence of CHD in about 2000 persons. Dominican adults aged 20 through 76 years were medically examined in 1993. Data of nationally representative Japanese and Americans which included serum lipid levels were compared. Total cholesterol levels (TCH) in Dominicans were lower than those in Americans. High-density lipoprotein cholesterol levels in Dominicans were lower than those in Japanese and Americans. The prevalence of hypertension and current smoking rates in Dominicans were similar to that of Americans and lower than that of Japanese. TCH in Americans have substantially been declining and those in Japanese were inadequate for preventing CHD. The prevalence of CHD in Dominicans may be lower than that of Americans viewed from the recent levels of main risk factors. Community wide health programs have spread to people with hypertension a decrease in the incidence of CHD should occur. J Epidemiol, 1997; 7 : 238-243.

community wide survey, cross-sectional study, risk factor, international comparison, coronary heart disease

The Dominican Republic is an island country situated in a subtropical zone of Central America and is a developing country in which the 30% of the population is concentrated in the capital city. The population density is about half of that of Japan in 1990. The culture and socio-ecological system on the Dominican Republic are different from Japanese as an epidemiological procedure.

To clarify the presumption of prevalence of CHD in the Dominican Republic and provide the priority of health care, a cross-sectional study for collecting the risk factors of CHD were carried out and compared with recent Japanese and American data while considering the socio-ecological factors.

MATERIALS AND METHODS

Under the direction of the Department of the Public Health and Social Welfare, which offers health care services, and inside technical assistance from the Dominican epidemiologist, a geographically representative cluster sample of 2000 individ-
Individuals were interviewed and examined. A cluster was a region. Nineteen clusters were chosen by random sampling out of 246 regions. The schedule of the medical examinations gave notice ahead by the Dominican Lion's clubs volunteers. So almost all persons participated in the each cluster.

Items of nonresponse for measuring serum lipid results in 36 persons are missing data. The estimates reported are based on a sample of 1964 adults 20 years of age or order. The measurements of the height, body weight, blood pressure (BP), serum total cholesterol, High-density lipoprotein (HDL) cholesterol, and smoking habits were carried out on Dominican males, and females, that had not underwent any therapy and had not suffered any chronic disease.

The subjects lived in 5 areas which represent 29 public health administration areas (Bani, Monte Plata, La Vega, Samana, and San Pedro de Macoris) other than the capital and capitals of the Dominican Republic (Santo Domingo) from November to December in 1993. In Santo Domingo, high, middle, and low income families lived separately in different regions. Representation of upper income areas taken for this examination were Arroyo Hondo and El Millon. Four regions represented middle income areas and low income areas were represented by 8 regions.

BP was measured on the right arm, with the subject in the sitting position after at least five minutes at rest. Regular mercury sphygmomanometers were used. Systolic (SBP) and diastolic blood pressure (DBP) were recorded to the nearest 2 mmHg. DBP was determined at the beginning of Korotkoff phase V. Hypertension was defined as SBP > or = 140 mmHg or DBP > or = 90 mmHg.

The average temperature was about 25°C. Adults were dressed, the weight of this clothing total approximately 0.2 to 0.5kg. No adjustment was made for clothing weight in this analysis. Body weight was measured with an electronic-load cell scale in kilograms, to two decimal places. Height was measured with a fixed stadiometer. Body mass index (calculated as weight in kilogram divided by height in meters, squared), was used as a measure of weight for height. For the present analysis, overweight was defined as a BMI value > or = 27.8 for male and > or = 27.3 for female as same as NHANES III 7). Dominican cooperative direct staff carried out measuring, blood collecting, and interviewing in this nation-wide medical examination. All lipid analyses were conducted on venous blood serum samples that were collected at the mobile examination units. The samples were frozen and transported by air on dry ice to the central laboratory in Oita Medical University where lipid analysis was conducted. Serum lipids in this survey were standardized according to the criteria of the CDC or the CDC-National Heart, Lung, and Blood Institute Cholesterol Standardization Network 8). Therefore, international comparison is possible on the basis of a serum lipid standardization.

RESULTS

Age-specific mean total cholesterol level of male Dominicans were lower under age 54, but similar to those of Japanese at 55 and over (Fig. 2). Fig. 2 showed female Dominicans were lower than the mean value of Japanese at all-age groups. Age-specific mean total cholesterol levels of Dominicans were lower than those of Americans at all-age and gender groups. Age-adjusted total cholesterol levels of Dominicans were 173 mg/dl for male and 179 mg/dl for female when age adjusted to the 1990 US civilian10). These levels were significantly lower than Japanese and American levels. The proportion of hypercholesterolaemia over 240 mg/dl was higher in the upper classes compared to the lower classes in Dominicans classified by social class for 962 subjects in Santo Domingo. On the other hand, age-specific mean HDL cholesterol levels were lower than those of Japanese and Americans in all-age and gender groups (Fig. 3). Age-adjusted HDL cholesterol levels were 38 mg/dl for males and 41 mg/dl for females. Those levels were significantly lower than those of the Japanese and Americans. The age-specific mean of systolic and diastolic blood pressure (SBP and DBP) of Dominicans was compared with those of Japanese classified by body mass index (BMI) and gender (Fig 4, Fig. 5). Those levels increased with BMI in both nations. However the age-specific mean of systolic and diastolic blood pressure of Dominicans were lower than those of Japanese of both genders. The age-adjusted prevalence of hypertension in Dominicans was 28.4% and was lower than non-Hispanic blacks (32.4%), higher than non-Hispanic white (23.3%) and Mexican American.
(22.6%), so then similar to those of American (24.2%) in 1988-1991, but significantly lower than those of Japanese (38.1%) in 1990\(^9\)\(^{13}\)\(^{14}\). There was not a relation between hypertension and BMI in Dominicans, although the rate of the hypertension increased with the increase of BMI in Japanese. Comparisons of prevalence of being overweight between three nations showed that the age-specific prevalence of Dominicans was higher than those of Japanese and lower those of American (Fig. 6). The age-adjusted prevalence of being overweight in Dominicans was 19.1% and was significantly lower than those of American (33.0%)\(^9\), but significantly higher than those of Japanese (8.0%)\(^9\).\(^10\). The proportion of the subjects that were over 24.0 at BMI\(^9\) was remarkably higher in Dominicans compared to the Japanese, particularly female Dominicans of 30 to 40 years of age were as twice as the Japanese. Current smokers in male Dominicans were 24.3%, and those of female were 17.1%, which were almost similar in American (25.5% in 1991)\(^9\), and lower than male and higher than female in Japanese (male 55.6% and female 9.5% in 1990)\(^9\).
The proportions of people with high blood pressure under antihypertensive treatment and control in the Japanese - particularly for middle-aged and older adults, most particularly women - showed progress that had been achieved by the late 1970s in Japan27. Nevertheless, at the level of BMI, there are higher mean levels both of SBP and DBP in the Japanese than in the Dominicans for ages 30-69 years of both genders. Even if the patients receiving anti hypertensive treatment in Japan were excluded, mean levels of both SBP and DBP in the Japanese should probably be higher than Dominicans at the level of BMI. The prevalence of hypertension in Dominicans was similar to Americans. It has been clarified that mean levels of both SBP and DBP in the Japanese than in US whites at every level of BMI26. It is less likely that transient elevations of blood pressure caused by the "white coat" phenomenon played a role in the examination in Dominicans, because the measurement of blood pressure was carried out by a trained Dominican staff. The blood pressure data probably provided the most accurate and precise estimates of hypertension detection and control to date in the general population.

BMI is an accepted and commonly used measure of obesity in population studies, and values of 30.0 or greater can be considered hazardous for health20. In the data presented, the prevalence of being overweight in Dominicans was lower than in Americans. Not only is the occurrence of obesity in the United States (US) stunningly high, it is particularly so among women and among minority groups. Also, alarmingly, it is continuing to increase. This is of concern because increasing obesity is associated with greater morbidity and higher mortality. Disease incidence that rise with increasing weight include diabetes mellitus, hypertension, dyslipidemia, cardiovascular disease, stroke, gout, sleep apnea, osteoarthritis, and some forms of cancer25,26.
The cause of over 30% of deaths of Dominicans illustrated with a disease related with the circulatory diseases by the mortality statistics in 1985. Of course, the circulatory diseases involved the congenital heart disease, myocarditis, and rheumatic heart disease, but there was no evidence of the invasion of respiratory syncytial viruses except for acute rheumatic fever in the Dominican immigrants in New York city in the 1980s. It was considerable that most of the circulatory diseases in adults were CHD.

The involvement of Dominicans in each risk factor in CHD remarkably differs from a comparison with each risk factor of Japanese and Americans. It suggests that the prevalence of CHD in Dominicans may be lower than the level in Americans in the present period. In planing of the cross-sectional study in Dominicans, we considered the subjects number to be able to take an international comparison of the risk factors for CHD according to the assessing CHD mortality and morbidity. The number of males and females each extracted almost 200 each from 30 years age to over 50 years age stage in this survey. High blood pressure is one of the most modifiable risk factors for the decline of CHD in Americans. Socio-ecological levels in Dominicans became similar to the levels of Americans. A variety of life style improvements is also a guarantee to be suggested. However, the actual life style that prevents CHD is not details in the Dominican Republic and should be investigated. Despite these favorable trends, particularly, some people with hypertension are unaware of their condition, and many more are untreated or inadequately treated. The Tobacco industry figures show that between 1962 and 1988 the total apparent cigarette consumption of the Dominican Republic rose 3.7-fold. Most of that increase was the result of promotion by Philip Morris, which now dominates the Dominican market, particularly in the young generation. So if a community wide health education and community organization program targeting the primary CHD risk factors were carried out in the Dominican Republic, CHD knowledge and risk factor prevalence could be favorably changed.

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REFERENCE


