

OBSERVATIONS

Sociodemographic Variables for Predicting Diabetes in Panama

Sociodemographic variables (SDVs) are an important component in the epidemiological profile of diabetes mellitus (DM); however, they are not critical for the onset of the disease, since we must consider multicausality (1), as well as other risk factors related to lifestyles and genetics.

In Panama, in 2012, concluded the first population-based survey of risk factors associated with cardiovascular disease in adults ≥ 18 years (PREFREC). This was a cross-sectional, descriptive study, with a single-stage, probabilistic, and randomized sampling strategy with a multivariate stratification. The research evaluated SDVs such as living in urban, rural, and indigenous areas; sex; age; social and cultural groups (SCGs) (white, African Panamanian [Afropanamanian], Asian, and mestizo), educational level, and civil status. It also addressed biological and risk factors such as the DM (2) in a representative sample of 3,590 individuals.

Having as a reference that population growth, aging, and urban development are social determinants related to the increase in DM (3), the SDVs studied in PREFREC were used to estimate the probability of developing DM among Panamanians by using multivariate analysis (logistic regression model). Relative risk was applied for risk analysis and CIs for a 95% level. Statistical significance ($P \leq 0.05$) and the maximum likelihood

ratio were used in the selection of the model. Case subjects were considered to have DM if they had estimated probabilities of ≥ 0.09 (median value).

The analysis suggests that being a member of an indigenous population is a protective SDV for developing DM compared with other SCGs (RR 0.54 [95% CI 0.35–0.84]). Living in indigenous area was also a protective factor with respect to those living in urban and rural areas (RR 0.35 [95% CI 0.17–0.73]). In this regard, the country's experience has been that many indigenous populations, once they move from their communities to urban areas, modify their habits, adopting those practiced in the city, so that they tend to develop obesity, DM, and other elements of metabolic syndrome, as has been reported by other authors (4,5).

The variables that contributed significantly to the model were the area, sex, age, and SCG (maximum likelihood ratio 2,734; $P = 0.0000$), which explain the 65.0% of DM cases studied in PREFREC (221 of 340), so we consider that the use of this model can serve as a tool in a clinical care for estimating the probability a Panamanian has of developing DM. In conclusion, being a native, of female sex, and a young adult (18–29 years old) and living in an indigenous area are SDVs related to a lower probability of having DM, while a higher probability of having this disease occurred among individuals from urban areas, males, older adults (≥ 60 years of age), and Afropanamanians.

ANSELMO JOAQUIN MC DONALD POSSO, MA, MD¹
 JOSE A. MONTENEGRO G., MD²
 CLARA ELENA CRUZ, MA³
 AIDA LIBIA MORENO DE RIVERA, MA, MD¹
 ALBERTO CUMBRERA, MTECH¹

From the ¹Gorgas Memorial Institute for Health Studies, Panama City, Panama; the ²Ministry of Health, Endocrinology Service, Santo Tomas Hospital, Panama City, Panama; and the ³Faculty of Sciences, University of Panama, Panama City, Panama.

Corresponding author: Anselmo Joaquin Mc Donald Posso, ansemc@hotmail.com.

DOI: 10.2337/dc13-0103

© 2013 by the American Diabetes Association. Readers may use this article as long as the work is properly cited, the use is educational and not for profit, and the work is not altered. See <http://creativecommons.org/licenses/by-nc-nd/3.0/> for details.

Acknowledgments—No potential conflicts of interest relevant to this article were reported.

A.J.M.D.P., J.A.M.G., and A.L.M.d.R. researched data, wrote the manuscript, and gave final approval of the version to be published. C.E.C. and A.C. researched data and wrote the manuscript. A.J.M.D.P. is the guarantor of this work and, as such, had full access to all the data in the study and takes responsibility for the integrity of the data and the accuracy of the data analysis.

The authors thank the researchers, technical, and administrative personnel who participated in developing PREFREC.

References

1. Ripsin CM, Kang H, Urban RJ. Management of blood glucose in type 2 diabetes mellitus. *Am Fam Physician* 2009;79:29–36
2. American Diabetes Association. Executive summary: standards of medical care in diabetes—2012. *Diabetes Care* 2012;35 (Suppl. 1):S4–S10
3. Wild S, Roglic G, Green A, Sicree R, King H. Global prevalence of diabetes: estimates for the year 2000 and projections for 2030. *Diabetes Care* 2004;27:1047–1053
4. Asociación Latinoamericana de Diabetes. Epidemiología de la Diabetes Mellitus en Latinoamérica. *Revista de la Asociación Latinoamericana de Diabetes* 2000;(Suppl. 1):116–119
5. Alvarado-Osuna C, Milián-Suazo F, Valles-Sánchez V. Prevalencia de diabetes mellitus e hiperlipidemias en indígenas otomíes. *Salud Publica Mex* 2001;43: 459–463