from around the world

• focus on South America

Cardiology in South America

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South America is the fourth largest geographic area in the world, with an estimated population close to 380 million inhabitants distributed in its 12 countries. In most of the countries, the population is quite heterogeneous in their socioeconomic situation, and one can easily identify an epidemiologic transition whereby the 3 levels of receding pandemics, degenerative and man-made diseases, and delayed degenerative diseases patterns are observed. Ischemic heart disease, stroke, hypertensive heart disease, Chagas disease, and rheumatic heart disease are, in this order, the likely causes of cardiovascular mortality and disability in most of these countries.

The population size, cardiovascular mortality rate, number of cardiologists in each national cardiology society, and their scientific production as obtained from the World Health Organization (http://www.who.int/cardiovascular_diseases/resources/atlas/en/), and the abstracts presented at the American College of Cardiology meetings, are shown in Table 1. They are an indication of the interest in yielding quality publications from these countries, and point toward the adequacy of steps to be taken to further enhance this endeavor.

In the past years, interesting scientific articles have been published in local periodicals. We scrutinized those journals and made a random selection from each of the South American countries with a regular, accessible publication of what seemed to be outstanding original articles in the year 2006.

Fernández A, Ferrante D, Hrabar A, et al. Prognostic Value of the Body Mass Index in Patients With Chronic Heart Failure: The GESICA Registry. Rev Argent Cardiol 2006;74:204–10

Study Objective

This study sought to verify the possible prognostic role of body mass index (BMI) in the evolution of patients with heart failure.

Methods

A cohort of 2,331 adult ambulatory patients with stable ischemic or nonischemic heart failure of at least 3 months' duration, included as of May 1999 in 64 health centers throughout Argentina (National Heart Failure Registry, GESICA), was evaluated with a mean follow-up of 957 days.

Heart failure was defined as the presence or history of any of the following signs or symptoms that improved with diuretics: dyspnea on exertion (not attributable to any other cause) and/or paroxysmal nocturnal dyspnea and/or acute pulmonary edema and/or signs of systemic venous congestion. Patients with heart failure caused by valvular or congenital disorders, hypertrophic cardiomyopathy, or pericardial disorders were excluded, as well as patients with severe chronic comorbidities.

End points assessed were death and cause of death, admissions for decompensated heart failure, and admissions for other causes.

A cutoff point of BMI was chosen based on the occurrence of events. The association between mortality and BMI was tested with univariate and multivari-

Table 1 Characteristics of Cardiovascular Disease and Resources in South America

Countries	Population* (Millions) 2005	Age-Standardized Mortality Rate by Cardiovascular Causes (per 100,000 Population)†	Number of Cardiologists Registered in the National Societies of Cardiology	Number of Publications on Cardiovascular Diseases (1991–2001)‡	Number of Abstracts Presented at the American College of Cardiology Annual Scientific Session (2000–2006)
Argentina	32.6	212	3,600§	110	39
Bolivia	9.2	260	110	—	—
Brazil	186.4	341	11,000	307	145
Chile	16.3	165	254	53	3
Colombia	45.6	240	899	11	2
Ecuador	13.2	244	65	3	—
Guyana	0.7	526	—	—	—
Paraguay	6.2	291	111	1	—
Peru	28.0	190	330	3	—
Suriname	0.4	421	—	—	—
Uruguay	3.5	208	120¶	2	—
Venezuela	26.6	241	170¶	—	2

*From World Development Indicators Database, April 2006. Available at: http://web.worldbank.org. †World Health Statistics. Available at: http://www.who.int/topics/mortality/en/. ‡Available at: http://www.who.int/cardiovascular_diseases/en/cvd_atlas_29_world_data_table.pdf. §Number of full members of the Argentine Society of Cardiology. There is an estimation of more than 7,000 cardiologists in this country. ¶Estimated by local authorities.

ate analyses, including potential confounding factors (Cox regression).

Results

The population, according to BMI categories, was grouped as follows: <20 kg/m^2, 61 patients (2.61%); 20 to 24.99 kg/m^2, 668 patients (28.65%); 25 to 29.99 kg/m^2, 999 patients (42.85%); and 30 kg/m^2 or higher, 603 patients (25.86%). A higher BMI was related to less severe heart failure and lower mortality. A multivariate analysis showed: BMI <20 kg/m^2: hazard ratio (HR) 1.72 (95% confidence interval [CI] 1.14 to 2.59, p = 0.009), BMI 25 to 29.99 kg/m^2: HR 0.78 (95% CI 0.64 to 0.95, p = 0.015), BMI ≥30 kg/m^2: HR 0.79 (95% CI 0.63 to 0.99, p = 0.047).

Conclusions

The BMI provides additional prognostic information in ambulatory patients with HF. Its prognostic value is similar in different subgroups of patients according to left ventricular function, time from diagnosis, and comorbid conditions.

Comments

This study presents additional evidence already pointed out in the literature, mostly through retrospective analysis, about the apparent paradoxical protective effect of obesity in the evolution of heart failure. Because obesity in itself is often identified as a proinflammatory condition, this protective effect is hard to believe if one considers that the obesity helps to defend against the intensively activated inflammation that is documented in advanced cases of heart failure. In the future, prospective studies with serial measurement of these cytokines will help to elucidate this phenomenon.

Vilas-Boas F, Feitosa GS, Soares MBP, et al. Early Results of Bone Marrow Cell Transplantation to the Myocardium of Patients With Heart Failure Due to Chagas Disease. Arq Bras Cardiol 2006;87:159–66

Study Objective

This study sought to evaluate feasibility, safety, and early effects of bone marrow cell transplantation to the myocardium of patients with congestive heart failure caused by Chagas disease.

Methods

We studied 28 patients (mean age 52.2 ± 9.9 years), of whom 24 were male. Despite optimized treatment, 25 patients were in New York Heart Association (NYHA) functional class III, and 3 patients were in NYHA functional class IV. The procedure consisted of aspiration of 50 ml of bone marrow, separation of the mononuclear fraction, and intracoronary injection. Effects on left ventricular ejection fraction, distance walked in the 6-min walking test, quality of life, NYHA functional class, and arrhythmogenic and biochemical parameters were all evaluated.

Results

There were no complications directly related to the procedure. Baseline left ventricular ejection fraction was 20.1 ± 6.8%, and 60 days after transplantation it increased to 23.0 ± 9.0%, $p = 0.02$. Significant improvements were observed in the NYHA functional class (3.1 ± 0.3 to 1.8 ± 0.5, $p < 0.0001$); quality of life (50.9 ± 11.7 to 21.8 ± 13.4, $p < 0.0001$), and distance walked in 6 min (355 ± 136 m to 443 ± 110 m, $p = 0,003$). The number of ventricular premature beats in 24 h tended to increase (5,322 ± 4,977 to 7,441 ± 7,955, $p = 0.062$), but without increase in ventricular tachycardia episodes (61 ± 127 to 54 ± 127, $p = 0.27$).

Conclusions

Our data show for the first time that intracoronary injection of bone marrow mononuclear cells is feasible and suggest that it may be potentially safe and effective in patients with congestive heart failure caused by Chagas disease.

Comments

This pilot study is very relevant and explores a new form of therapy for patients with heart disease. It is the first study in this area that deals with Chagas heart disease. This condition is still prevalent in South America, where there is an estimation of more than 20 million people affected, and some 5 million expected to develop heart disease, out of which 1 million will have its severest form, which presents a very poor prognosis with the currently established treatment for heart failure. This study originated a much larger National Health Department-funded multicenter, randomized, double-blind, placebo-controlled study to determine the efficacy of this method, and has already been launched in Brazil.

Lira MT, Kunstmann S, Guarda E, Villarroel L. Accuracy of the Self Report Method for Establishing the Prevalence of Cardiovascular Risk Factors in Healthy Adults: Results of the RICAR Project. Rev Chil Cardiol 2006;25:191–7

Study Objective

This study sought to determine in a healthy adult population the accuracy of their self-reported normal or abnormal values of blood pressure (BP), total cholesterol (TC), and blood sugar (BS), compared with clinical findings.

Methods

A questionnaire about their own BP, TC, and BS was answered by 12,190 healthy adults from the RICAR Project (Riesgo Cardiovascular, de la Sociedad Chilena de Cardiología) (6,320 women and 5,870 men, mean age 47.6 ± 12 years). Those who knew their parameters (BP, n = 2,430; TC, n = 1,163; BS, n = 1,556) were asked if they had normal or abnormal values. Using standardized methods, we measured systolic blood pressure (SBP) and diastolic blood pressure (DBP), TC, and BS and compared the referred data of normality/abnormality with clinical findings.

Results

The SBP and DBP were respectively incorrectly reported as normal in 18.2% and 15.6% of the population. For TC and BS, the mistaken reported normal values were 44.9% and 15.8% respectively. Women had significantly more accurate self-reported normal values than men for SBP, DBP, and BS: 84.3% versus 77.6%; 88.7% versus 77%, and 97.5% versus 94%, respectively ($p < 0.0001$), although they had a significantly lower education level than men. Positive predictive values for abnormal SBP, DBP, TC, and BS were 54.3%, 46.7%, 75.1%, and 41.8%, respectively. Negative predictive values for the same parameters were 81.7%, 84.4%, 55.1%, and 96.4%, respectively. True versus apparent prevalences showed differences with an overestimation of systolic hypertension 30% versus 32.6%, diastolic hypertension 25.7% versus 32.6%, and high BS 10% versus 16.7%. Kappa index was low among these methods.

Conclusions

Knowledge of their own BP, TC, and BS were suboptimal in this population. Self-report induced a significant difference between true and apparent prevalence of cardiovascular risk factors. These results show the unreliability of self-reported data to establish accurate cardiovascular risk factors prevalence in this population.

Comments

This important study clearly shows the need for local evaluation of most of the scientific observations, especially for those who deal with less easily verifiable variables, such as is often is the case in population studies, to surpass educational and cultural differences. Self-reported data have been used in some large health surveys in the United States and Europe, and some of those reports might influence important decisions regarding public health. Even in those places, the validity of the methods has been questioned. The present study shows that for the fundamental variables that

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access risk factors for cardiovascular disease in a Chilean population, reliability is not adequate.

Sierra-Laguado J, García RG, Celedón J, et al. Insulin Resistance Index Assessment by HOMA and Its Relation With the Risk of Pregnancy-Induced Hypertension. Rev Col Cardiol 2006;12:459–65

Study Objective

This study sought to assess whether insulin resistance determined by homeostatic model assessment (HOMA) is an early predictor of the development of pregnancy-induced hypertension in Colombian pregnant women.

Methods

This was a nested case control study in a prospective cohort of 438 normotensive primigravidae women with gestational age <30 weeks. The HOMA was calculated using fasting plasma concentrations of glucose and insulin, determined by glucose-oxidase and chemoluminescence methods, respectively.

Results

Twenty-three pregnant women developed pregnancy-induced hypertension (5.25%). Two normotensive pregnant women were selected as controls for each case, matched by gestational and maternal age at enrollment. The women who subsequently developed pregnancy-induced hypertension had higher levels of HOMA (1.48 ± 0.98 vs. 0.96 ± 0.70, $p < 0.001$), which was associated with an increased risk of developing pregnancy-induced hypertension (odds ratio 3.8, 95% CI 1.1 to 12.8, $p = 0.01$). Systolic blood pressure levels at enrollment were significantly higher in pregnant women who later developed pregnancy-induced hypertension (106 ± 12 vs. 97 ± 10, $p < 0.01$), showing an interaction with the levels of HOMA in the multiple logistic regression model.

Conclusions

Women who subsequently developed pregnancy-induced hypertension were more insulin resistant before the onset of clinical manifestations of the disease. The HOMA index could be a useful tool for screening women at risk of developing pregnancy-induced hypertension.

Comments

The mechanisms involved in the development of pregnancy-induced hypertension have not yet been fully elucidated, nor has a simple method that reliably will predict its development been established. The HOMA should eventually be tested against other methods to evaluate its comparative performance regarding reliability and cost effectiveness.

Raggio V, Esperón P, Lorenzo M, et al. CYP2C9 and Apolipoprotein E Variants and Individual Response to Warfarin. Rev Urug Cardiol 2006;21:104–16

Study Objective

This study sought to examine the influence of the genetic variants of CYP2C9 and apolipoprotein E (ApoE) on inter-individual variability in response to warfarin and the risk of adverse reactions in an Uruguayan population.

Methods

The study involved 55 patients undergoing chronic oral anticoagulant treatment with warfarin. Data on daily maintenance dose, pharmacokinetic response, and adverse reactions were collected. The CYP2C9*1, *2, and *3, and ApoE E2, E3, and E4 genotype were determined by standard procedures.

Results

Carriers of CYP2C9*3 allele required the lesser maintenance dose, followed by CYP2C9*2 allele carriers and then CYP2C9*1 homozygotes ($p = 0.049$). The CYP2C9*3 allele carriers had more episodes above the range of the International Normalized Ratio and required more dose adjustments to achieve a proper anticoagulation; adverse events were more frequent in patients with CYP2C9*1/*3 regarding bleeding events as wells as overanticoagulation. Presence of ApoE E4 allele is associated with a moderately elevated sensitivity to warfarin.

Conclusions

This study is the first carried out on this subject in an Uruguayan population, and confirms an increased sensibility to warfarin and risk of adverse effects in carriers of the CYP2C9*3 allele and in carriers of ApoE E4 variant, which could be useful in warfarin dose and risk individualization during treatment with this drug.

Comments

There is a steadily increasing amount of evidence that points toward a future of better individualization of pharmacologic treatment based on pharmacogenetics.

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