

2019 Dr. Pedro Cossio Foundation Award

Premio Fundación Dr. Pedro Cossio 2019

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The Scientific Committee of the 45th Argentine Congress of Cardiology selected 4 works to contend for the 2019 Dr. Pedro Cossio Foundation Award. Following the tradition installed 33 years ago, we shall make brief comments about the works selected.

WINNING WORK

The MATEAR registry: Normal national echocardiographic values for the diameters of the thoracic aorta; which are the upper reference values? Authors: Marta Carrero, Iván Constantín, Juan Benger, Federico M. Asch, Federico Cintora, Silvia Makhoul, Sergio Baratta, Rodrigo Bagnati Measurement of thoracic aorta diameter during routine transthoracic echocardiography is important because its dilation predicts major events such as aortic valve insufficiency, aortic aneurysm or acute dissection. Besides measuring the different segments of the aortic root (aortic annulus, sinuses of Valsalva, sinotubular junction, ascending aorta, aortic arch and descending aorta), the correct measurement of the aortic annulus is nowadays of crucial importance during the evaluation before transcatheter aortic valve implantation (TAVI).

Several publications have defined the normal dimensions of the aortic root, as the American Society of Echocardiography guidelines (1) and the chapter by Guevara in the book “*Ecocardiografía para la guía de decisiones clínicas*” (Echocardiography as a guide for clinical decisions) by Piñeiro et al. (2) But all these publications are based mainly on registries of Anglo-Saxon populations, and in general they do not perform a thorough analysis of anthropometric, demographic or ethnical factors.

The MATEAR (*Medición de aorta torácica por ecocardiografía en Argentina*) (Echocardiographic measurement of thoracic aorta in Argentina) registry was a prospective, observational and multicenter registry carried out by the Cardiac and Vascular Doppler Echocardiography Council of the Argentine Society of Cardiology with the participation of 45 centers from 16 Argentine provinces. The registry included 1,000 healthy subjects >18 years and 55.3% women. The

fact that the patients were selected among those cases referred by their physicians for Doppler echocardiography is a bias as they are not entirely representative of the general population.

Remarkable aspects of this investigation: The study design included the analysis of multiple dependent factors such as sex, age, body mass index, height, blood pressure and ethnical ancestry.

The investigators obtained precise cutoff values for Argentine population groups. The height-adjusted values of the aortic annulus, sinuses of Valsalva and sinotubular junction, but not of the other portions, were significantly higher in men versus women. Diameters increased with age in both sexes, except for the aortic annulus. Apparently, the diameter of the annulus remained constant due to its fibrous and rigid elements, unlike the other sectors which are more elastic and vulnerable to changes in blood pressure and in the histological conformation of their layers.

The authors conducted an ethnical analysis comparing Iberian ancestry (55%) vs. native American ancestry (41%). Surprisingly, only 4% of the remaining population was of other descent: Italian, rest of Europe, Asian or mixed lineage. In this sense, subjects with Iberian ancestry had larger dimensions indexed to body surface area or height in all the aortic segments, except for the descending aorta. Confounders such as blood pressure, lipids or other cardiovascular risk factors which may be heterogeneously present in both populations, were not considered.

Despite these observations, this study represents an advance in reporting the measurements of the thoracic aorta extracted from the Argentine population and adjusted to various demographic, anthropometric and ethnical factors.

SPECIAL MENTION OF THE JURY

The addition of echocardiographic parameters to the PESI risk score improves the prediction of mortality in patients with acute pulmonary thromboembolism: the PESI-ECHO score. Authors: Lucrecia M Burgos, Cristhian E. Scatularo, Ignacio M. Cigalini, Juan C.

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SEE RELATED ARTICLE: Rev Argent Cardiol 2020;88:14-25. <http://dx.doi.org/10.7775/rac.v88.i1.17194>

¹ President of the Jury of the Dr. Pedro Cossio Foundation Award

Jauregui, Maico I. Bernal, José M. Bonorino, Jorge Thierer, Ezequiel J. Zaidel.

Pulmonary embolism (PE) is a prevalent and serious condition and represents the third cause of cardiovascular mortality after myocardial infarction and stroke. Mortality is variable, ranging from 1% in the mildest cases to 60% or higher in PE with cardiac arrest or cardiogenic shock. (3) This wide range of mortality rates promoted the design of prognostic indexes aimed at categorizing patients according to their expected risk, in order to decide the adequate management and treatment strategies for each case. The Pulmonary Embolism Severity Index (PESI) has been widely validated and is the most used tool as it is simple and easy to apply in clinical practice. (4)

The aim of this study was to determine whether transthoracic Doppler echocardiography (TTE) can provide additional information to the one provided by the PESI score. Data were examined from the "Acute Pulmonary Embolism in Argentina XX CONAREC Registry". Among the 684 patients included in the registry, 356 (52%) undergoing TTE on admission were analyzed. Systolic pulmonary artery pressure (SPAP) and tricuspid annulus plane systolic excursion (TAPSE) were measured in all these patients and the PESI-Echo score was calculated according to the following equation: PESI + SPAP - TAPSE. (5)

All-cause in-hospital mortality was 11%. Mean PESI-Echo score of those who died was 172 ± 61 vs. 100 ± 50 in surviving patients ($p < 0.001$). The area under the ROC curve was 0.75 for the PESI score and 0.82 for the PESI-Echo score. The cutoff point of 128 for the PESI-Echo score showed a sensitivity of 82%, specificity of 69%, negative predictive value of 96% and positive predictive value of 27%. In addition, the PESI-Echo score recategorized 23% of patients as high risk.

Pulmonary hypertension (evaluated with SPAP) and left ventricular dysfunction (estimated through TAPSE) are non-invasive parameters of high prognostic value in patients with PE. Although these results could only be applied to half of the patients included in the general registry, the introduction of this new score is a significant contribution for risk stratification of PE on admission.

This paper is another in the large series of registries carried out by the CONAREC that describe the reality of cardiovascular diseases in Argentina. However, as with every CONAREC registry, the sample analyzed corresponds to centers with cardiology residency programs, representing academic institutions of moderate or high complexity that may not be representative of the general population of Argentina.

OTHER PAPERS SELECTED

Impact of metabolic disorders and sex on atherosclerotic burden in the obese: Is it possible to speak of the obesity paradox in primary prevention? Authors: Ma-

ría N. Brenzoni, Sergio A. González, Fabián E. Ferroni, Máximo A. Schiavone, Renzo Melchiori, Pablo D. Kempny, Jorge A. Chiabaut Svane, Carlos E. Castellaro

Using data from a Hospital Austral registry on primary prevention of cardiovascular diseases, the authors analyzed 1,551 subjects between 30 and 65 years of age without clinical cardiovascular disease or diabetes (primary prevention). They collected demographic, clinical and biochemical data, measured the body mass index (BMI) and quantified the area of the atherosclerotic (ATS) plaque by Doppler ultrasound of the carotid and iliofemoral arteries. The patients were distributed into four groups: obese (BMI > 30 kg/m²), non-obese (BMI < 30 kg/m²), with metabolic syndrome (MS) and without MS. The distribution by sex was heterogeneous; 61% of the cases without MS and non-obese condition were men, but in the other three groups the percentage of men ranged between 10% and 16%.

The percentage of ATS plaque in both vascular territories and in combination was almost twice as much in subjects with MS (obese or non-obese) than in those without MS ($p < 0.01$). In contrast, the presence of ATS plaque in the obese group was lower in both sexes, although in men the difference was not significant [women (OR: 0.5 95% CI 0.20-0.85); men (OR: 0.85 95% CI 0.59-1.19)]. These results should be interpreted as the response of the deleterious action all the conditions contained in the MS have on endothelial structure and function. On the contrary, obesity would have a "protective" effect on the endothelium, particularly in women.

Obesity is a known strong predictor of vascular risk. (6) However, there are studies that show a "J" or "U-shaped" curve in populations with heart failure, coronary artery disease or hypertension, so patients with low BMI have a worse prognosis than those with normal BMI.

This "obesity paradox" is a controversial concept, since it is not universally accepted that it is really a "paradox". (7) Body wasting or cardiac cachexia can be a confounder, as well as high BMI due to exaggerated muscle growth. Other mechanisms responsible for this paradox have been proposed. (8)

This study proposes that this "paradox" could also exist in primary prevention.

Impact of prolonged cardiopulmonary bypass time and changes in plasma osmolarity on cardiovascular events at two years: a prospective cohort. Authors: María T. Politi, Virginia Barba, Gustavo Salvo, Facundo Serafica, Raúl Ferreyra, Guillermo Bortmann, Antonio Piazza, Claudia Capurro

Cardiopulmonary bypass (CPB) time and preoperative risk scores have a major impact on the postoperative outcome of cardiovascular surgery. (9) Prolonged CPB time increases mortality and postoperative complications such as neurological sequelae, kidney fail-

ure, bleeding, infection, vasoplegic or cardiogenic shock and low cardiac output syndrome, among others. Inflammation, endothelial dysfunction, oxidative stress, and myocardial edema are some causes of this association, but increased plasma osmolarity (PO) could also be involved.

The aim of this study was to analyze the association between PO and long-term clinical outcomes. The variation between preoperative and postoperative PO was measured. Plasma osmolarity was estimated using a simple and validated formula: $PO = Na + K + BUN + Glucose$. (10) A total of 115 patients undergoing cardiovascular surgery with CPB were included. Mean age was 66 (58-73) years, 71% were men, 50% underwent isolated cardiopulmonary bypass surgery and 32% combined procedures; mean CPB time was 80 (69-106) minutes; 68% were scheduled surgeries, 28% urgent surgeries and 4% emergency surgeries.

Prolonged CPB time was above 80 minutes and a PO >10 mOsm was considered PO variation. The primary outcomes were mortality or the composite of mortality, rehospitalization and reintervention at two years. The results reflect 84% of the cases with complete follow-up.

Neither CBP time nor change in PO resulted predictors of mortality, but both of them were significantly associated with the composite outcome. Probably, patients with prolonged CPB time had more advanced cardiovascular disease and, thus, worse mid-term outcome. But the results of this study suggest that increased PO could be one of the mechanisms to explain the poor long-term outcome in patients with prolonged CPB time, probably due to permanent injury of the endothelial cells.

The jury of the 2019 Dr. Pedro Cossio Foundation Award was formed by the former presidents of the

Argentine Society of Cardiology, Dr. Ricardo Esper and Hugo Grancelli, to whom I am grateful for their skilled and responsible participation.

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