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EDITORIAL COMMENT

More effective prediction of mortality in Chagas heart disease patients? Importance of cardiopulmonary stress testing☆

Cardiopatia chagásica: predição mais eficaz de morte nestes doentes? Importância da prova de esforço cardiopulmonar

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Chagas disease, an infection caused by a protozoan parasite, *Trypanosoma cruzi*, is a major public health problem with a considerable global disease burden and costs. It is the third most prevalent serious parasitic infection worldwide after malaria and schistosomiasis.[1]

The disease is endemic in South America and incidence is high, with around 11 million infected individuals,[2] despite efforts to fight the disease that have included extensive campaigns to eradicate the disease's insect vectors.

Large-scale migrations have enabled Chagas disease to cross borders and to spread worldwide. Since it can also be transmitted by blood transfusions and organ transplantation, it has become necessary to screen blood donors,[1] particularly in the USA, where there are large immigrant populations, and in Europe, especially in Spain and Portugal, but also in other countries.[1]

Cardiac involvement is found in 25-30% of cases,[4] and it is reported that a third of infected patients in Brazil have Chagas cardiomyopathy.[6] Prognosis is heavily dependent on the development of heart disease.

The mechanisms responsible for Chagas cardiomyopathy have been thoroughly studied. Three main processes are involved: inflammation, cell death and fibrosis. Various explanations have been put forward for this cardiomyopathy, including the neurogenic theory (development of parasympathetic disautonomy leading to sympathetic predominance and catecholamine toxicity), microvascular dysfunction, autoimmune reactions, and immune responses to surviving parasites, with lymphocyte infiltration into cardiac tissues.[1,3] These mechanisms lead to dilated cardiomyopathy and ventricular arrhythmias that may be malignant, sudden death, heart failure and thromboembolic phenomena.

Sudden death can occur in asymptomatic patients in the latent stage of the disease and is due to tachyarrhythmias – ventricular tachycardia and/or ventricular fibrillation – or more rarely bradyarrhythmias – complete atrioventricular block, asystole and sinus node disease. The incidence of sudden death is high; it is the cause of death in Chagas heart disease in 55-65% of cases.[4]

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The importance of sudden death in Chagas disease has prompted efforts to predict which individuals are at greater risk through the use of risk scores, enabling a more aggressive and interventionist approach to these patients.[4,5]

The best-known is the Rassi score, described and validated in a paper by Anis Rassi and Maurício Scanavacca's group, published in the *NEJM* in 2006. It classified patients into three risk groups (low, intermediate and high) on the basis of six parameters: functional class, cardiomegaly, wall motion abnormalities, ventricular tachycardia on Holter, low QRS voltage, and male gender. Patients classified as high-risk should receive more aggressive, invasive treatment, particularly implantation of a cardioverter-defibrillator.

The authors of the study published in this issue of the *Journal*,[6] Silva et al. from Rio de Janeiro, aim to improve the discriminatory and predictive value of the Rassi score by introducing a new parameter, the anaerobic threshold, as assessed by cardiopulmonary exercise testing. They retrospectively studied 150 patients with evidence of Chagas cardiomyopathy, 45 of whom had undergone cardiopulmonary exercise testing with a cycle ergometer ramp protocol.

Their results show that introducing the anaerobic threshold as a parameter into a logistic regression model together with the Rassi score increased the score's predictive power for estimating mortality risk by 5%. The study population was a low-risk one, with little cardiac involvement, but even so the finding that reduced anaerobic threshold was associated with increased mortality risk is a significant one for this new parameter.

The authors explain their finding of the discriminatory power of this parameter in low-risk populations as being due to the detection of early impairment of right ventricular function and left ventricular diastolic function, parameters that have previously been described as indicating risk, before the eventual appearance of systolic dysfunction and left ventricular dilatation.[6]

They highlight the importance of the anaerobic threshold and of functional capacity for the detection and assessment of early cardiac impairment in Chagas disease, and their significant clinical value.

Conflicts of interest

The author has no conflicts of interest to declare.

References

1. Marin-Neto AJ, Rassi A. Update on Chagas disease on the first centennial of its discovery. Rev Esp Cardiol. 2009;62:1211–6.
2. Bestetti BR, Otaviano PA, Fantini PJ, et al. Prognosis of patients with chronic systolic heart failure: Chagas disease versus systemic arterial hypertension. Int J Cardiol. 2013;168:2990–1.
3. Punukollu G, Gowda RM, Khan IA, et al. Clinical aspects of the Chagas' heart disease. Int J Cardiol. 2007;115:279–83.
4. de Souza AC, Salles G, Hasslocher-Moreno AM, et al. Development of a risk score to predict sudden death in patients with Chaga's heart disease. Int J Cardiol. 2015;187:700–4.
5. Rassi A Jr, Rassi A, Little WC, et al. Development and validation of a risk score for predicting death in Chagas' heart disease. N Engl J Med. 2006;355:799–808.
6. Silva RR, Reis MS, Pereira BB, et al. Valor adicional do limiar anaeróbio em um modelo de predição de morte geral em uma coorte urbana de pacientes com cardiopatia chagásica. Rev Port Cardiol. 2017;36:927–34.