

Echocardiographic evaluation of the cardiovascular effects of DNA vaccines containing *Trypanosoma cruzi* genes on dogs with experimental Chagas disease

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Statement of the Problem: Chagas disease (ChD) is caused by *Trypanosoma cruzi*. This Neglected Tropical Disease is also considered as an emerging disease in the USA and Europe. Two plasmids containing genes encoding a trans-sialidase protein (TcSP) and an amastigote-specific glycoprotein (TcSSP4) were studied previously as prophylactic and therapeutic vaccines. Echocardiography is a valuable tool in diagnosis and follow-up of patients with ChD. The purpose of this study is to determine the prophylactic effect of *T. cruzi* genes on echocardiographical hemodynamic parameters in chagasic dogs.

Methodology & Theoretical Orientation: Dogs were DNA-plasmid immunized and infected with metacyclic trypomastigotes. Doppler echocardiography were performed before and 7-19 months after immunization and/or infection in all dogs.

Findings: All non-vaccinated dogs had fractional shortening values decreased, suggesting an impairing in general cardiac function. Differences in the left ventricular ejection fraction values among infected and non-infected dogs were demonstrated. Left ventricular diastolic and systolic diameters were decreased in vaccinated dogs, therefore protection of progressive heart damage or heart dilation could be prevented. Systolic peak time was higher in infected and mock-vaccinated/infected groups increasing


vulnerability to malignant arrhythmias and sudden death. Left ventricular volumes were elevated in infected groups suggesting a decrease in wall thickness that might lead to increased size of the heart cavity except for the vaccinated group with the plasmid that carried the TcSP gene.

Conclusions: Experimental ChD in dogs causes cardiac dilation, poor contractibility and heart failure; the pathological process can be diagnosed by echocardiography better than other techniques in the living patient. Properties of plasmid-DNA vaccination with *T. cruzi* genes may be important in the amelioration of *T. cruzi*-induced cardiomyopathy. Using echocardiography, structural and functional changes in the chagasic heart could be monitored easily and, this should be the method of choice for characterizing the clinical stages of ChD.

Speaker Biography

Olivia Rodríguez-Morales is researcher in medical sciences at the National Institute of Cardiology, Ignacio Chávez in Mexico City, Mexico, where she conducts investigation lines related to the study of the basis of molecular pathogenesis, diagnoses, prophylaxis and therapy against *Trypanosoma cruzi*. Dr. Rodríguez-Morales is also professor in the Autonomous National University of Mexico (UNAM) where she teaches "Veterinary Cell Biology" and "Veterinary Bacteriology and Mycology" in the Faculty of Veterinary Medicine and Zootechnics. She belongs to the National System of Researchers Level 1 in Mexico.

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