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## LETTER TO THE EDITOR

### Thromboembolic findings in patients with heart failure at autopsy

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Patients with heart failure have multiple risk factors for thromboembolic events, such as blood stasis in the lower limbs and heart chambers<sup>1</sup>, endothelial injury, and hypercoagulability<sup>2</sup>. Clinically, these phenomena are reflected in the high frequency of thromboembolic events with a significant impact on morbidity and mortality; in this sense, it has been reported that heart failure may increase the chances of cerebrovascular accidents up to 4.3 times<sup>3</sup>; additionally, ventricular thrombi are found in up to 49% of the autopsies of patients with dilated cardiomyopathy, and mural thrombi have been described in 68% of the patients with ventricular aneurysms<sup>4</sup>.

Despite the fact that the risk for thromboembolic events is increased throughout the heart failure population, some clinical conditions may offer additional risk. Patients with atrial fibrillation and those with Chagas disease, for instance, have a greater risk for the occurrence of thromboembolic events.

Autopsies are considered the “gold standard” in terms of providing the most definitive data on diagnostic accuracy, and have been used to compare *in vivo* and *postmortem* diagnoses<sup>5</sup>. Previous analyses indicate that diagnostic discrepancies remain high, even in the face of advances in diagnostic techniques<sup>6,7</sup>; these findings are sustained when data are adjusted for time and geographical variations<sup>8</sup>.

Therefore, we hypothesized that thromboembolic

findings are frequent in patients with heart failure and sought to analyze the presence of these findings in patients after autopsy.

In order to do so, we designed a retrospective study based on the analysis of 1457 autopsies reports performed in a university hospital dedicated to cardiology from January 2000 through July 2006. Were selected patients who had one of the following diagnoses: heart failure, cardiomyopathy, or cardiogenic shock in the autopsy report. Were excluded patients who underwent surgical or percutaneous cardiac interventions during the hospital admission in which death occurred, patients under 18 years of age or with congenital heart diseases, and patients with pericardial diseases.

Altogether, 595 autopsies reports were included in the study and were further analyzed, searching for data as sex, age, arterial hypertension, diabetes mellitus, cause of death, heart failure etiology, left ventricular ejection fraction and the occurrence of a thromboembolic event.

The events were classified based on their contribution to the patient's death mechanism according to previous criteria:<sup>9,10</sup> (1) events that were deemed to be the cause of death, (2) events related or contributors to death process, and (3) events unrelated to death. The cause of death was defined as the condition that led directly to death, excluding final events of a terminal disease. Diseases related to death were defined as contributing conditions to the primary cause

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of death, complications of the primary cause of death, or other diseases that contributed to death. Events classified as unrelated to death were defined as those who had no contribution to death mechanism.

In the study, we sought to investigate the occurrence of thromboembolic events in patients who had undergone autopsy. The main finding of our study is that patients with heart failure have a high frequency of thromboembolic events (39.2%) at autopsy, and many patients had more than a single event (1.6 events per patient); importantly, thromboembolic events were frequently associated with the death process. Further, we identified female sex and Chagas

etiology as independent risk factors for the occurrence of thromboembolisms. Our findings are derived from a large population of heart failure patients submitted to autopsy including different etiologies.

Taken together, our results indicate that thromboembolic events are frequent in patients with heart failure who have undergone autopsy and are frequently associated with the death process. Our findings have significant clinical implications as they warrant a high degree of suspicion for these occurrences, especially during the care of more susceptible populations such as women and Chagas patients.

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