Whole-Body Electrical Bioimpedance Is Accurate in Noninvasive Determination of Cardiac Output: A Thermodilution Controlled, Prospective, Double-Blind Evaluation

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Background: The NiCaSTM is a novel non-invasive apparatus based on whole body electrical bio-impedance for simple, sensitive and inexpensive screening technique for cardiomyopathy. It can be performed at the same time as conventional 12-lead ECG, using the exact same equipment.

Methods: Patients were recruited while randomized in a study evaluating the efficacy of Tezosentan (a ET-A/B endothelin antagonist) in patients admitted due to acute heart failure (CHF). Patients were randomized after having been hospitalized due to acute heart failure with dyspnea at rest, CI < 2.5 L/min/m² and PCWP > 20 mmHg.

Study Protocol: At baseline and during treatment with study drug at the pre-specified time points of 0.5, 1.25, 3.4 and 6 hours from randomization CO was determined by both thermodilution and the NiCaSTM apparatus at each time point.

Results: Out of 130 patients enrolled, in 93 CO was measured simultaneously by both methods at all the pre-determined time points. The overall Correlation between the two methods was R=0.81. Precision and bias were 0.01±0.6 L/min. There was a difference between the two methods in cardiac output readings. When Measuring CI of both methods was < 2 L/min/m² CO readings were statistically significantly lower on NiCaS when compared to Cis. We have calculated the cardiac power index (Cpi=C/CI×mean arterial pressure), and found that low Cpi (indicating reduced myocardial contractile reserve) was related to higher recurrence rates of CHF. However, Cpi based on NiCaS CI measurement (NiCaS Cpi) was a better predictor of recurrent CHF than thermodilution Cpi (Th Cpi), due to less accurate prediction in patients with high Cpi.

Conclusions: NiCaS is a novel accurate non-invasive method for CO determination. The results of the present study suggest that NiCaS is probably at least as accurate as thermodilution for CO determination.
Sp=61%) and MRI (Se=56%; Sp=92%). ROC analysis showed that, in comparison to the combination of ECG, SAECG, Hol and ETT, the area under the curve did not differ significantly for their combination with MRI.

Conclusion: This study demonstrates that an ECG offers the highest sensitivity and the SAECG offers the highest specificity in diagnosing ARVD. MRI offers high specificity but its combination with the ECG, SAECG, ETT and Hol does not improve the utility of the other tests significantly.

Figure: Receiver operating curve analysis for comparison of combinations conduction tests and MRI for diagnosis of ARVD

T127-105  Transient Left Ventricular Apical Ballooning Syndrome: A US Case-Series
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Background: Transient left ventricular apical ballooning syndrome (TLVAS) is a distinct form of acute reversible left ventricular dysfunction which was initially described in Japan. It’s frequency and clinical presentation in the U.S. is unclear. This is one of the first descriptions of the syndrome in a U.S. population.

Methods: We identified 10 patients during the year 2002 who had: 1) apical LV ballooning with akinesis or dyskinesis extending beyond a single major coronary artery distribution; 2) a coronary angiogram revealing no stenosis greater than 70%; 3) new ST segment/t wave changes on the presenting electrocardiogram. We investigated the clinical characteristics and short-term outcome of these patients with TLVAS.

Results: All patients were white females; mean age 71.5±12.0 years. Presenting symptoms were chest pain in 5, dyspnea in 3, and chest pain and dyspnea in 2 patients. Eight had at least 1 mm of ST elevation in contiguous leads, typically V2-V5. The QTC was > 500ms in seven patients with a mean QTC of 519 ms±50 ms for all patients. All patients had troponin T and/or CK-MB elevations. The highest recorded median peak troponin T and CK-MB values were 0.59 ng/ml (25th-75th percentile 0.33-0.93 ng/ml) and 14.1ng/ml (9.7-26.9 ng/ml), respectively. An identifiable preceding acute emotional or physiologic stressor was present in 8 of 10 patients. All coronary stenosis in patients with CAD were < 50%, except for 1 patient with a chronic 60% mid-LAD lesion. The mean LVEF at admission was 44.8±10.2%, which improved to 58.4±11.9% at follow-up (22±41 days); p=0.004. All 7 patients with available follow-up had resolution of wall motion abnormalities (29±45 days). Five patients developed left heart failure requiring treatment. All patients were alive at a median follow-up of 6.5 months (range 1-17 months).

Conclusion: This is one of the first series reporting TLVAS in a US population. TLVAS can mimic AMI with ECG changes, elevation of cardiac biomarkers, associated left ventricular dysfunction and in some, clinical heart failure. The short-term prognosis appears favorable with resolution of LV dysfunction. Further studies including long-term follow-up are needed.

T127-106  Usefulness of Tissue Doppler Imaging for Evaluating Systolic and Diastolic Left Ventricular Function in Patients With Primary Cardiac Amyloidosis
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Background: Cardiac amyloidosis is characterized by an early impaired in systolic and diastolic function in patients with primary amyloidosis. Methods and Results: Standard 2-D, Doppler and tissue Doppler echocardiographic study was performed in 12 consecutive patients with primary amyloidosis confirmed by biopsy and 12 matched (age 62±14, 8 males in both groups) normal volunteers. The data were on-line or off-line analyzed using Vivid 7, GE and Echo Pac. The parameters are present average segmental values as means±SD. T test was used for comparison. The diastolic functions of patients with primary amyloidosis were abnormal (6 were relaxation impaired; 3 were pseudonormal; and 4 were restrictive). Tissue Doppler data were present between three types, but not significantly; which may due to limited cases number.

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Background: Takotsubo cardiomyopathy (TC) has been previously described in the Japanese and more recently European literature. This is the first report of this condition in a US population. TC is characterized by (1) suspected acute MI based on symptoms, electrocardiographic (ECG) changes, and increased cardiac serum markers; (2) lack of obstructive coronary artery disease; (3) transient hypotension; (4) wall motion abnormalities in the absence of acute coronary artery disease; and (5) recovery of cardiac function within a few days.

Methods: From January 2002-August 2003 we admitted 9 patients with features consistent with TC to our institution. To clarify whether tissue Doppler imaging at multiple left ventricular LV sites could help estimate LV systolic and diastolic function in patients with primary amyloidosis.

Methods and Results: Standard 2-D, Doppler and tissue Doppler echocardiographic study was performed in 12 consecutive patients with primary amyloidosis confirmed by biopsy and 12 matched (age 62±14, 8 males in both groups) normal volunteers. The data were on-line or off-line analyzed using Vivid 7, GE and Echo Pac. The parameters are present average segmental values as means±SD. T test was used for comparison. The diastolic functions of patients with primary amyloidosis were abnormal (6 were relaxation impaired; 3 were pseudonormal; and 4 were restrictive). Tissue Doppler data were present between three types, but not significantly; which may due to limited cases number.

Conclusion: Takotsubo Cardiomyopathy is an unusual and probably underdiagnosed entity. Our data from the first American cohort confirm prior reports of a clinical presenta-