IMPORTANCE LUNG IMPEDANCE-GUIDED TREATMENT OF THE PATIENTS WITH ACUTE MYOCARDIAL INFARCTION FOR PREVENTING ACUTE HEART FAILURE AND REDUCING LONG-TERM MORTALITY

ACC Poster Contributions
Ernest N. Morial Convention Center, Hall F
Monday, April 04, 2011, 3:30 p.m.-4:45 p.m.

Session Title: Acute Myocardial Infarction -- Risk Prediction
Abstract Category: 3. Acute Myocardial Infarction—Therapy
Session-Poster Board Number: 1105-313

Authors: Michael Shochat, Avraham Shotan, Mark Kazatsker, Vladimir Gurovich, Elena Naiman, Lubov Vasilenko, Aya Asif, Ilia Shochat, Yaniv Levy, Dabid Blondheim, Simcha Meisel, Hillel Yaffe Heart Institute, Hadera, Israel

Background Patients sustaining acute myocardial infarction (AMI) frequently develop acute heart failure (AHF) during hospitalization. Ongoing monitoring of lung fluid content (LFC) may enable the prediction of impending AHF and prompt early therapy, thus precluding AHF and improving clinical outcomes.

Aims To find out whether non-invasive lung impedance (LI) may be a surrogate endpoint for monitoring evolving AHF and LI-guided treatment improves clinical stay.

Methods The new 20-fold more sensitivity method for LI measurement based on transverse distribution of electromagnetic energy through the chest was used. For verification changes in LI we used chest X-rays. X-rays were interpretive as radiological score (RS) from 0 to 10. 40 healthy volunteers and 624 AMI patients with no clinical and radiological signs of AHF on admission underwent LI monitoring.

Results Study patients were monitored for 94±42 hours. In the healthy volunteer group, maximal LI decrease was < 6% (p=NS) from baseline. Of 624 AMI patients, 424 patients did not develop AHF (Gr1). Their maximal LI decrease from baseline was ≤ 12% (p<0.001). 136 patients developed overt AHF (Gr2). On appearance of clinical and radiological signs of AHF, LI decreased from baseline by 19.9% (p<0.0001) and at peak AHF, LI decreased by 35.8% (p<0.0001). Clinical improvement was achieved by therapy and LI returned to initial level at discharge. LI correlated with RS (r = -0.9, p<0.001). Preventive therapy was initiated in 64 other patients when LI decreased by 12-15% (Gr3). At this stage, patients had no clinical and radiological signs of AHF. In contrast to group 2 where all patients developed AHF, only 15% of group 3 patients developed AHF. Clinical characteristics, LVEF and peak CPK were similar in gr2 and 3. Compared with gr2, LI-guided early therapy in gr3reduced hospital stay 1.4-fold (p<0.01), re-hospitalizations 1.6-fold (p<0.01) and 4-year mortality 3.3-fold (p<0.01).

Conclusions

LI is a good surrogate parameter reflecting LFC
LI predicts AHF development with 98% sensitivity
Early therapy in AMI patients prevents AHF in 85% patients.
Early LI-guided treatment improves short and long term clinical outcome.