האיגוד הישראלי לכירורגית לב וחזה
THE ISRAEL SOCIETY OF CARDIOTHORACIC SURGERY
האיגוד הקרדיולוגי בישראל
ISRAEL HEART SOCIETY

The 60th International Conference of the Israel Heart Society
in association with the Israel Society of Cardiothoracic Surgery
22-23 April 2013, ICC International Convention Center, Jerusalem

Evaluation of the Effectiveness of In-hospital Treatment of Chronic Heart Failure Patients during Exacerbation by Non-invasive Net Lung Impedance Monitoring During Admission

Michael Shochat BSc, MD, PhD,FACC[1], Avraham Shotan, MD[1] , Mark Kazatsker MD[1], Iris Dahan, MSIT[1], Lubov Vasilenko, MD[1], Elena Noiman MD[1], Yaniv Levy MD[1] , Ilia Shochat BSc[1], Tatiana Sigalov, MD[1] , Aaron Frimerman, MD[1], Aya Asif MD[1], David Blondhaim MD[1], Simcha Meisel MD, MSc, FACC[1]

Hillel Yaffe Medical Center, affiliated to Technion, Haifa.

Acc. Professor Michael Shochat
23 April 2013, ICC International Conventional Center, Jerusalem

Disclosures:

Michael Shochat – President of RSMM start up company produced Edema Guard Monitor was used in this study.

Other co-authors have no to disclose.

Prediction and prevention of hospitalization for decompensation of chronic heart failure (CHF) patients is an unresolved issue.

We evaluated the ability of a new non-invasive method for lung impedance monitoring to predict decompensation in CHF patients.

CHF patients were monitored by a device that derives the net lung impedance (LI) from measured trans-thoracic impedance. This device has 50 higher resolution for measuring LI than existing ones. A decreasing LI reflects accumulation of lung fluid.
Assessment clinical status of patients and LI were recorded at each monthly outpatient visit. Normal baseline LI was calculated for each patient and current LI values are presented as change from baseline in percent.
Results 200 CHF patients (67±11 years-old, male- 85%, LVEF < 35%) at NYHA II/III/IV (77/90/33) were recruited after index hospitalization for acute heart failure (AHF) and followed in an outpatient clinic for 26±22 months. Initial NT-proBNP level was 3771±5185 pg/ml. Of study patients, 106 were not hospitalized while 94 required 326 re-hospitalizations for AHF.
Dynamics of LI before, in time and after hospitalizations for AHF is presented on Figure 1.

During hospital stay (4.3±5.1 days) LI increased to -30.4±12.5%. Study patients were divided by LI %change into groups. A: 0< DLI< 5%; B: 5 < DLI < 10%; C: 10 < DLI < 20% and D: DLI > 20%.

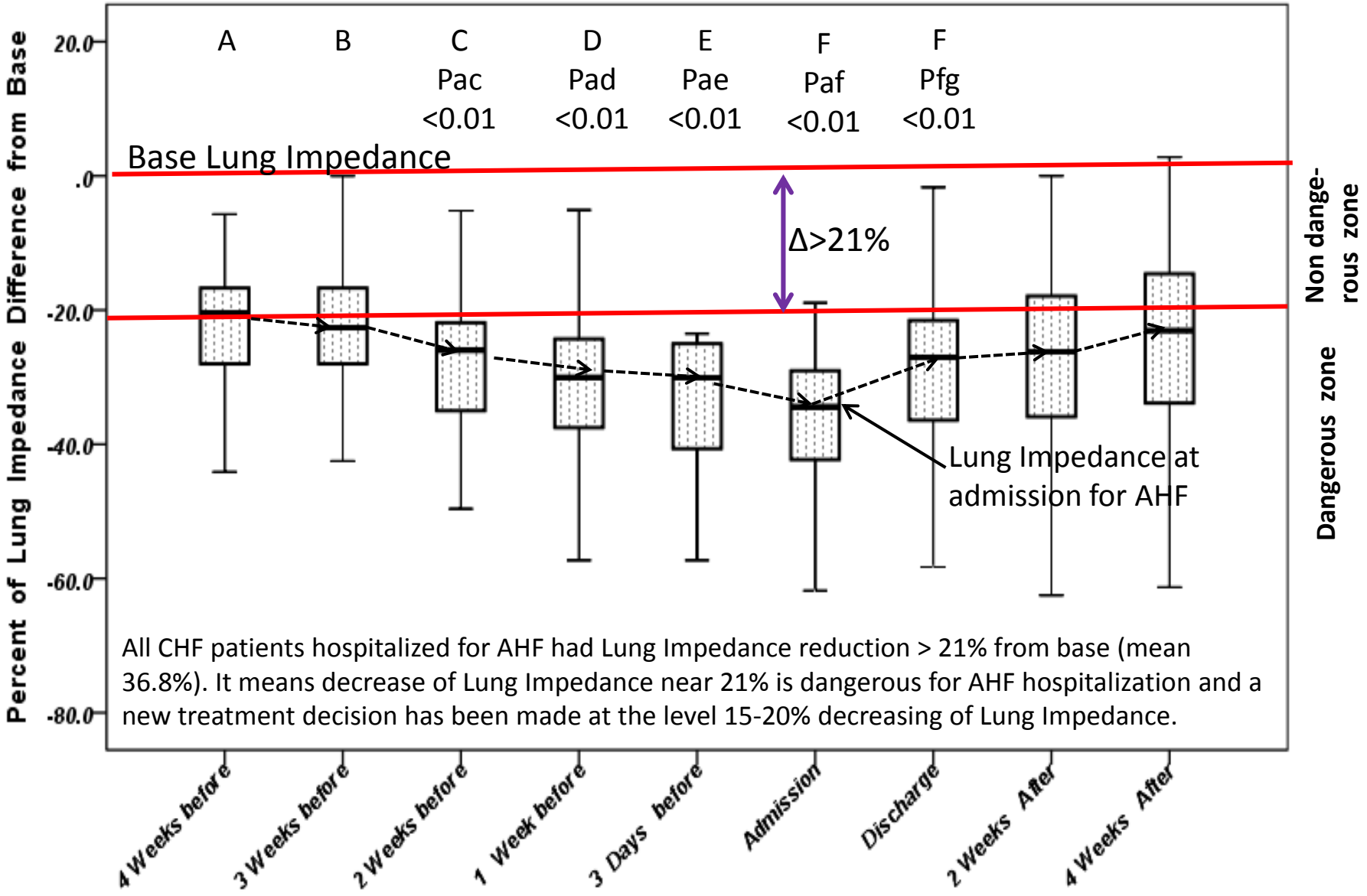

Figure 1 Dynamics of the Lung Impedance before, during and after AHF hospitalization

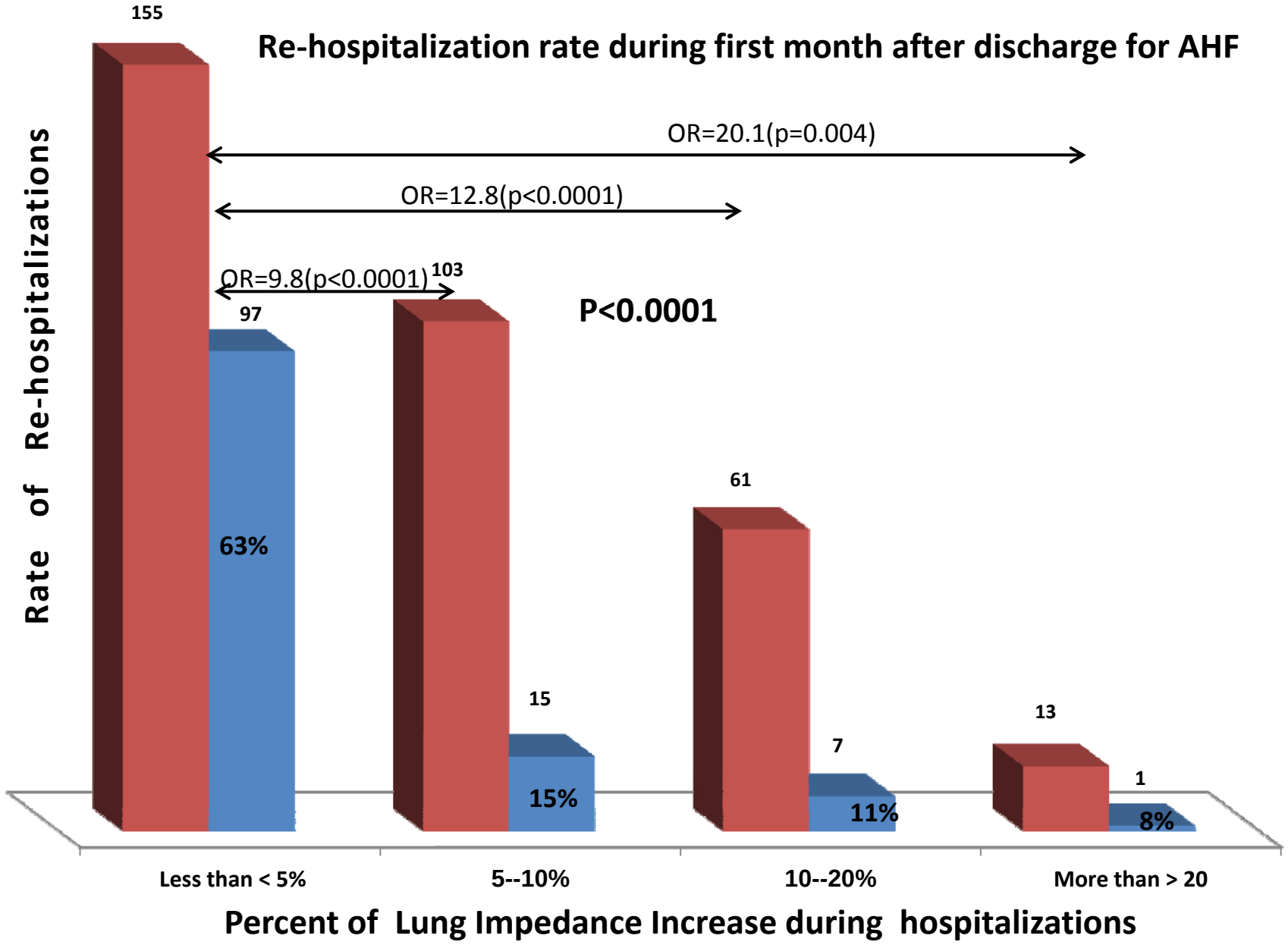
Re-hospitalization rate during first month after discharge for AHF
Rate of Re-hospitalizations
OR=20.1(p=0.004)
OR=12.8(p<0.0001)
OR=9.8(p<0.0001)
P<0.0001
155
97
63%
103
15
15%
61
7
11%
13
1
8%
Less than < 5%
5--10%
10--20%
More than > 20
Percent of Lung Impedance Increase during hospitalizations

Figure 2

Conclusions:

Noninvasive Lung Impedance monitoring may be used to evaluate effectiveness of therapy in hospitalized decompensated CHF patients.

Small (less 5%) improvement in LI during hospitalization is a very strong predictor for re-hospitalization during next month.