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38 **Safety and Beneficial Effect of Low Altitude (Dead Sea Location) in Patients with Systolic Heart Failure after ICD / ICD CRT Implantation**

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39 **The Predictive Value of Serum Urea and Renal Function in Patients with Heart Failure**

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Safety and Beneficial Effect of Low Altitude (Dead Sea Location) in Patients with Systolic Heart Failure after ICD / ICD CRT Implantation

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Introduction: Patients with systolic congestive heart failure (sCHF) after implantable cardioverter defibrillator (ICD) implantations are considered high risk patients and tend to avoid regular, recreational lifestyle. The Dead Sea area (415 m below sea level) has been conceived as a dangerous place for heart patients regardless of several encouraging studies that demonstrated its benefit.

The purpose of this study was to evaluate the safety, impact on QOL, exercise capacity, heart failure and arrhythmia parameters in pts. with sCHF and ICD

Methods: Heart failure parameters including: BNP, echocardiography and arrhythmia / ICD parameters of 19 pts with sCHF, NYHA FC II-III after ICD implantation (age 65.3±9.6 years, 16 (84 %) males, 18 (95 %) with CRTD) were evaluated. The parameters were tested at sea level one week prior to the decent to the Dead Sea, during 4 days stay in the Dead Sea and one week after return to sea level.

Results: The trip to and from the Dead Sea as well the 4 days of stay were uneventful and well tolerated. No significant arrhythmias were recorded by the ICDs. The QOL parameter improved by 11 points and six minute walk ability increased by 60 meters ($p < 0.001$). The BNP levels increased slightly with no statistical significance. The HRV decreased ($p=0.018$). No significant changes in blood pressure, O_2 saturation weight and LV function were found.

Conclusion: Descending and staying in Dead Sea is not only safe for patients with sCHF and ICD implantation but after a brief stay in the Dead Sea area there was a trend toward improvement in clinical and laboratory parameters and improvement in QOL and exercise capacity.

The Predictive Value of Serum Urea and Renal Function in Patients with Heart Failure

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Background: Renal function as well as urea are frequently abnormal in patients with heart failure and are predictive of increased mortality. The relative importance of each parameter is less clear.

Objectives: To prospectively compare the predictive value of renal function and serum urea on clinical outcome in patients with HF.

Methods: We prospectively enrolled 362 patients hospitalized with clinical HF. Patients were followed for short term (1 year) and long term (mean 6.5 years) clinical outcome.

Results: Discharge serum urea and BUN/Creatinine ratio were significant predictors of reduced survival at one year and of long term follow-up on multivariate Cox regression analysis, e.g. Log Urea: HR 3.0, 95% CI 1.7-5.4, P<0.00001. Reduced survival was seen in each of the tertiles of serum urea with 86% mortality in the highest tertile, compared with 55% in the lowest tertile at long term follow-up (Figure 1). Decreasing tertiles of discharge estimated glomerular filtration rate (eGFR) were a significant predictor of reduced long term but not short term survival. Including eGFR and serum urea together in the multivariate analysis demonstrated that serum urea remained a significant predictor of reduced survival while eGFR was no longer significant. Inclusion of eGFR and BUN/Creatinine demonstrated that BUN/Creatinine was independently significant in addition to eGFR suggesting that urea has additional significance as a predictor even after adjusting for renal function. Decreasing tertiles of serum urea was also a significant independent predictor of the probability of heart failure re-hospitalization and the combined end point of death and heart failure re-hospitalization.

Conclusions: Serum urea is a more powerful predictor of outcome compared to eGFR in patients with HF. Serum urea represents several biological parameters including renal function, intravascular volume, hemodynamics and the neurohormonal axis. Urea may be a more comprehensive marker of the general clinical status of patients with HF.
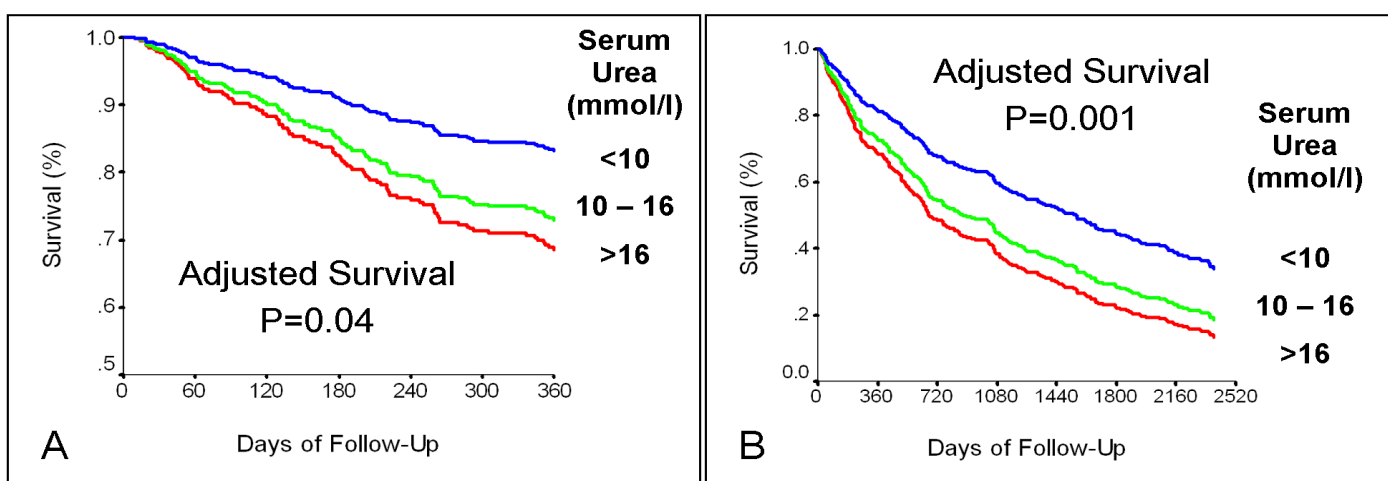
Figure 1: Cox regression adjusted one year (A) and long term (B) survival curves according to tertiles of discharge serum urea. Higher urea tertiles predicted reduced survival.