Red cell distribution width (RDW): A simple and cost effective marker for acute heart failure (AHF) in the Emergency Department

J. Searle1, A. Slagan1, F. Holert2, T. Lauterbach2, JO. Volland2, R. Muller3, S. Datwyler4, C. Mueller2, M. Mockel1 –
1Charité Berlin, Department of Cardiology CVL and Emergency Medicine CVL, CCM, Berlin, Germany 2Charité, CIV, Department of Laboratory Medicine and Clinical Chemistry, Berlin, Germany 3James Cook University, Townsville, Australia 4Abbott Laboratories, Abbott Park, IL, United States of America

Introduction:
Red cell distribution width (RDW) is a parameter of the standard full blood count originally used to classify anaemia. It has recently been shown to be a prognostic marker in patients with AHF. In 2007, Felker et al. tested 36 laboratory values in 2,679 symptomatic chronic heart failure patients to assess the relationship between routine blood test and outcome. RDW was found to be a strong independent predictor of morbidity and mortality (Felker M, Allen LA et al. JACC, 2007, 50:40-7).

Al-Najjar et al. compared RDW with NT-proBNP in 1,087 patients from a specialized HF-clinic and found a similar independent prognostic value across the first to third quartiles (Al-Najjar Y, Goode KM et al., EHF, 2009, 11:1153-1162).

Methods:
We enrolled 305 consecutive patients who presented to the ED with a chief complaint of acute dyspnoea. BNP was measured in EDTA plasma collected within a median of 2 hours after admission, using the ARCHITECT® BNP chemiluminescent microparticle immunoassay (Abbott Laboratories). RDW was measured in EDTA whole blood (flow cytometry) as part of the routine full blood count at admission.

The main hospital diagnosis was documented by the treating physician. Patients were contacted after 3 months to assess all-cause mortality and re-hospitalization. All variables are shown as median (25th/75th percentiles).

Results:
305 patients with acute dyspnoea were enrolled in the study. Of those, 16.4% (n=50) had an acute heart failure (AHF) as their underlying diagnosis. 24.1% had an acute coronary syndrome and 18.9% had COPD/acute pneumonia.

Patient characteristics for all patients and for patients with and without AHF as underlying diagnosis are displayed in table 1 and table 2.

Conclusion:
RDW helps to diagnose dyspnoeic patients with AHF, especially in combination with BNP, as they seem to identify different patients with AHF. Additionally, RDW proved to have prognostic value in patients with acute dyspnoea. RDW is a readily available and inexpensive marker, as it is part of the routine red cell blood count.

It can therefore easily be introduced into clinical routine to optimize early patient management, which is crucial to reduce morbidity and mortality in AHF.

ESC Congress, Paris, August 2011, Pres. No. 89855, Postersession 7, 31/08/2011, Poster Zone C, 8:30 -12:30 a.m.