Cyclic adenosine monophosphate level and functional state of red blood cells in patients with coronary heart disease and heart failure

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Aim:

To study the level of cyclic adenosine monophosphate (cAMP) and its relationships with the functional state of red blood cells (RBCs) in patients with coronary heart disease (CHD) and heart failure (HF)

Methods:

- We enrolled 65 CHD patients (48 (74 %) males, 17 (36 %) females; mean age 57±8 years): without (n=19) and with symptoms/signs of HF (n=46)
- The control group included 14 apparently age- and sex-matched healthy individuals
- The plasma level of cAMP was assessed by the use of immunoassay. The RBC deformability index (DI) was determined by means of filtration method
- Aiming to characterize RBCs energy metabolism, we studied the intensity of their glucose uptake per one hour of incubation at 37°C (glycolytic activity [GA])

Results:

The continuum «controls-CHD without HF-HF» was characterized by the increase of plasma cAMP level (Fig. 1), and decrease both RBC GA (Fig. 2) and DI (Fig. 3).

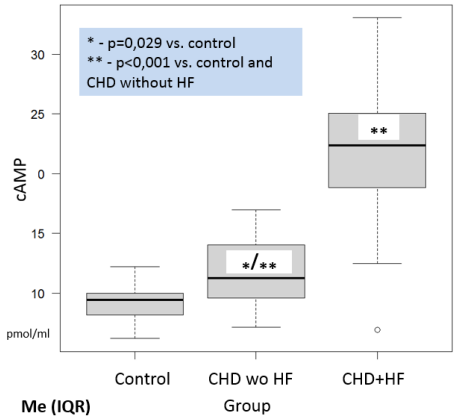

Fig. 1. Plasma cAMP level along HF continuum

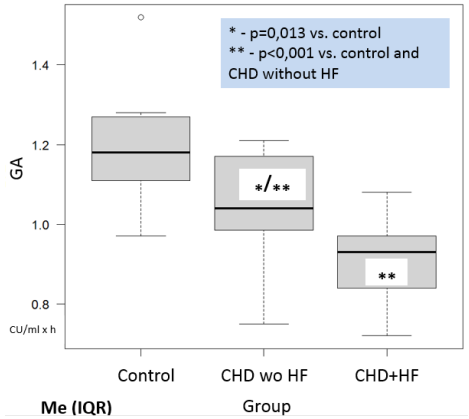

Fig. 2. RBC GA along HF continuum

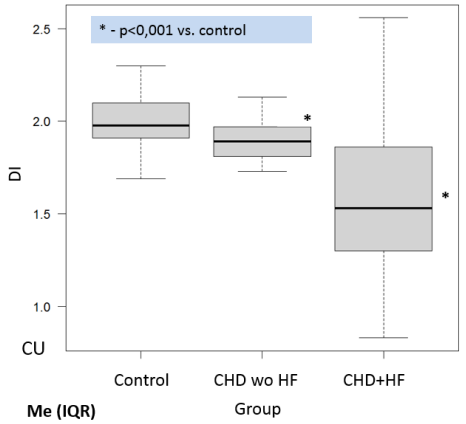

Fig. 3. RBC DI along HF continuum

The decrease of both RBC GA and DI, representing the RBC functiomal status impairment, correlated significantly with the increase of plasma cAMP level (Fig. 4 and 5, respectively).

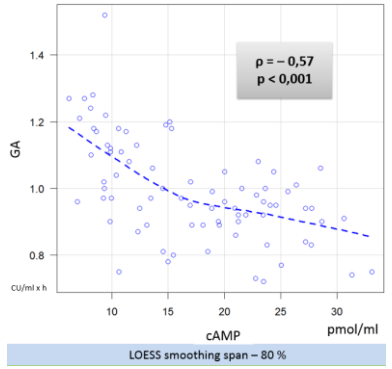

Fig. 4. Correlatin of RBC GA with plasma cAMP level

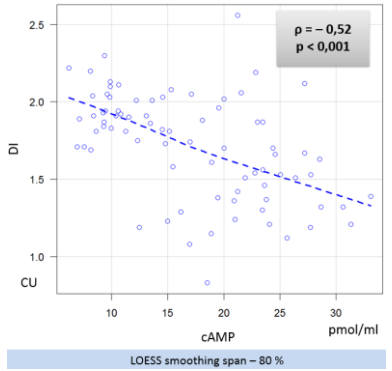

Fig. 5. Correlatin of RBC DI with plasma cAMP level

Conclusion:

In CHD patients with clinically manifested HF, the increase of cAMP plasma level correlated with the impairment of RBCs functional properties, namely DI and GA decrease.

NOTHING TO DISCLOSE